Comparative analysis of daylight glare metrics

مقارنة تحاليل لقياسات وهج ضوء النهار

by

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ABSTRACT

The objective of this work is to compare the outcomes of various daylight glare metrics including Daylight Glare Probability, CIE Glare Index, Unified Glare Rating, BRS Glare Index, Guth Glare Rating, and Visual Comfort Probability. A new glare metric was developed and is given the name of Glare Threshold Differential. Radiance software within IESVE environment was used as the simulation tool. Over 150 simulations were made for different orientations and for different observer locations. The findings indicate that different glare metrics do not result in the same conclusion. The new proposed metric has a potential to be a good indicator of daylight glare.

الملخص

الهدف من هذا العمل هو مقارنة النتائج مختلف قياسات وهج ضوء النهار بما في ذلك احتمال وهج ضوء النهار ، ومؤشر CIE الوهج ، وتصنيف الوهج الموحد ، ومؤشر BRS الوهج ، وتصنيف جوث الوهج ، وإحتمال الراحة البصرية. تم تطوير مقياس وهج جديد وتمت تسميته باسم Glare Threshold Differential. تم استخدام برنامج Radiance ضمن بيئة IESVE كأداة محاكاة. تم إجراء أكثر من 150 عملية محاكاة لتوجهات مختلفة ومواقع مراقبة مختلفة. تشير النتائج إلى أن مقاييس الوهج المختلفة لا تؤدي إلى نفس النتيجة. يحتوي المقياس الجديد المقترح على إمكانية أن يكون مؤشراً جيدًا على ضوء النهار..

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Dedication

This dissertation is dedicated to the memory of my mother and my father, who had always believed in my success and supported me to study my master. It really breaks my heart that you are not here to celebrate my graduation but your love and believe in me were always remembered which provided me with the strong will to complete my dissertation. Hope that I have made you proud.

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Nomenclature

A facade	Facade area (m2)
A glaze	Glazed area (m2)
CGI	CIE glare index
D	distance eye – to plane of source in view direction
DGI	daylight glare index
DGP	daylight glare probability
VCP	visual comfort probability
UGR	unifying glare rating
CGI	CIE Glare index
Ed	direct vertical illuminance at eye due to allsources (lux)
Ei	indirect vertical illuminance at eye (lux)
Ev	vertical illuminance at eye-level (lux)
H	vertical distance between source and view direction
Lb	background luminance (cd/m2)
Ls	glare source luminance (cd/m2)
P	Guth's position index
u-value	heat loss coefficient (W/m2 K)
Y	horizontal distance between source and view direction

Greek letters

R ceiling	total reflectance of ceiling in visible spectrum
R floor	total reflectance of floor in visible spectrum
R vis	total reflectance in visible spectrum
R wall	total reflectance of wall in visible spectrum
σ	angle between line of sight and line from observer to source (°)
Ʈ	angle from vertical of plane containing source and line of sight (°)
Ʈᶴ	total transmission of glazing in visible spectrum for perpendicular angle of incidence.
ωs	solid angle subtended by the source (sr)
ψ	angular displacement of the glare source from the Observer's line of sight.
Ωs	solid angle subtended by the source, modified bythe position of the source (sr)

1. Chapter 1: introduction.

1.1. Background.

People mostly want to live and work in a place has a good daylighting. Especially the physical activities, needs natural indoor lighting in order to enhance the indoor environment quality, it influences employee's productivity. Moreover, the performance will be affected in this way and works efficiency. The visual condition has an impact on the productivity of the labourers yet the relation between physical activity and visual environment is positive.

Normally conducting physical activities become uncomfortable to the labour when they become aware of visual discomfort. Moreover, minimal impacts will drive to body and mental issue when the eyes continue attempting to keep up a visual action more than its physiological potential.

These days, one of the most important characteristics of the indoor environment quality is using daylight in the building in two aspects physically and economically. The availability of the daylight with abundantly of its specialty in the office's indoor environment, Leeds to the ideal visual environment. When the daylight considers as the main source of light, some factors should be taken in the consideration in order to prevent the disadvantages and achieve the visual comfort, and one of these main factors is Glare.

The most recent glare assessment strategies are very valuable in detection of discomfort glare resulting from artificial light sources. Proposed formulas for discomfort daylight glare are few and unfortunately, discomfort glare was not predicted by any of these formulas from sun light or from direct daylight.

Phenomenological glare equations and assessment strategy have not been accomplished globally yet, and no standard checking systems are accessible. Glare is an additional risk for the sunlight control frameworks.

The vast majority of metrics respond just to the level of the illuminance, which even, is not sufficient for occupant's relief.

Investigating the quantity and the quality of the light has many attributes with difficulty to quantifying them. Many subjects in term of achieving the visual comfort and prevent the discomfort glare can be achieved by studying the main metrics of the glare index like: UGR, BGI, VCP, DGR, CGI, DGP and DGI. These variables will be discussed in details below in the methodology chapter, but here to give a hint about it.

Observer position is various in term of glare, the adaptation of the eye, the view direction also matters. So it is no big surprise that few lighting configuration instruments offer any glare measurements choice, a typical early plan stage of controlling glare planning is to assess it by needful on rendering produced for a couple of pictures and couple of minutes of time, or to not assess it by any way of the previous ways totally.. In this research, the author will find out if it applicable in the research parameters it is accordingly basic that architects be planning with progressively available and natural approaches to show glare, particularly in situations where daylighting is wanted. Besides, to be most valuable, this data ought to be accessible as a lot of yearly atmosphere glare information, appropriate to a zone of room, not only a private position. This represents a task, as a glare is exceedingly subject to an inhabitant position a view bearing a characterizes for in a certain time (Andersen et al. 2008)

1.2. Introduction about sustainability.

Renewable energy sources have been utilized dramatically year after year as well as the non-renewable assets because of the change and development of societies all over the globe. Individuals were utilizing around 3kg daily every person from the assets, this is as per stone-age society. In any case, the utilization expanded a little to become 11kg daily as per Agrarian society. In addition, in the eighteen century in the beginning of industrial revolution, individuals used per person around 44kg daily. The indication here shows the globe economy and worldwide population increases, increasingly crude assets and items are being used every year, this means if not possible to have a substitute for it, these materials will be finished in a few years later (Thaloob 2017).

Extraction of the row materials over the world is various due to the high demand of the industrial sector and the development of the cities, besides the increase of the population over the world. Also, the prosperity and the accessibility of the assets plus the education level.

As per the natural resources 2009, Asia was positioned in 2005 as the biggest mainland as far as assets extraction because of its huge territory and populace and it contributes with 48% of the all-out asset's extraction around the globe. North America comes next with contribution of (19%), and then the contribution of the Europe same as the south America contribution of (13%), and then Africa and lastly Oceania with week contribution (Thaloob 2017).

Recently, challenge is how to provide best lifestyle all over the world. In all societies away from getting on the side of natural resources and start make a clean energy like a renewable resource. Such as solar, wind and Water. In order to achieve this point, the world needs to reduce the extraction of natural resources and reduce using it in providing energy. This will lead to reduce the amount of non-renewable resources relies on to produce energy. Thus, by adopting new sustainable technologies with smart systems will help in the achievement on the sustainability.

Climate change occur because of high expending the assets and the different practice of people, that reason a few issues, for example, air contamination which lead to sicknesses what's more, poor air quality, water contamination and soil contamination. Which put the normal crisp water saves in threat, expanded corrosive downpour and consuming woods because of expanded temperatures and a dangerous atmospheric deviation. (World natural resource 2009).

1.3. Objectives of the Research

To compare different daylight glare indices as they relate to occupants' visual comfort in an open plan office environment.

The principle target of this research and study is to clear up and express the result of designing the building in term of achieving the sustainability and comfort for the occupants. Measure the occupant's visual comfort by analysis the daylight and the glare caused from the daylight. It additionally investigates the relationship between the visual relief, daylight accessibility and the variables selected in the parameter table in the methodology chapter is the base of the comparison.

The study of visual comfort and daylight will be done by simulating and investigating in a VE-IES software, it will be demonstrated how one can accomplish great sunlight and visual comfort conditions for office space. The thought is to execute this reasoning inside every investigation while fulfilling the customers and the employee's requirement.

1.4. Motivation of the study

The office building's area is one of the high demands of vitality consumption zones. This is principally because of the movement of business and open activities and the related interest for warming, cooling, lighting and other indoor devices. (ECEEE, 2014)

With a more important focus on vitality effectiveness and the emphasises of the architects and building guidelines that led the designs end up progressively more protected and hermetically sealed. Yet size of windows, which has a significant impact on the indoor environment quality, if the plan on the building site are not done legitimately. For inhabitants in business premises, it can end up with a noticeable decrease in efficiency because of poor warm solace and visual discomfort environment.

New ideas in the design of commercial buildings has an attribute which is increasing the windows portion in order to get more light with terrific perceivability and well day lit rooms. The Implementation and emphasises of the engineers are the cause of that. On the other hand, potential issues are frequently not considered or comprehended. In spite of the fact that the information is accessible. Windows if not in proper design and opining may cause:

- Daylight glare caused higher risk of visual discomfort.

- Distraction caused from direct or indirect sun light.

- Increased energy use for heating and cooling.

- Overheating.

- Greater challenge in optimizing energy use, visual and thermal comfort to a reasonable investment and life cycle cost.

- Unintentional heat losses during winter (depending on the glazing properties).

The work in this research will show how a well-designed area process could accomplish great by simulating this area and predict the discomfort glare and get the agreeable visual space while keeping up great levels of light to acquire larger level among occupants.

1.5. Structure of the research

In this, paper the information distributed in many chapters as below:

Chapter1: Introduction.

The main section is the initial part where in a general information about structure vitality utilization. Moreover, the recent worldwide circumstance and setting is introduced as far as high consumption of vitality, sustainability and environmental change. Additionally, the section shows the significance of this exploration and the advantages of examining such ideas.

Chapter2: Literature Review

This section, a general information of daylight and its direct light and the glare, points of interest, and weaknesses will be. Moreover, previous studies and papers, journals, and theses in the similar research subject will be investigated. Additionally, metrics of daylight and glare will be studied and clarified. At last, the issue articulation and the examination addresses will be referenced to explain the points also, goals of the examination.

Chapter3: Methodology

In this section, previous philosophies and methodologies involved by other researchers and analysts will be explained in detail. Subsequently, the chosen strategy for this dissertation will be picked and justifying it is the base of this chosen. Additionally, the parameters have variable and fixed points, and these will be listed and explained. Additionally, the configuration of the study model, and its design and the materials specifications will be clarified and elaborated.

At last, the section will be finished up by clarifying the calculation criteria determined by the writer to study the outcomes acquired from the exploration.

Chapter4: Discussions and results.

In this part, will talk in detail about, what the author comes up with throughout the study and simulation process.

Chapter5: Conclusion

In this section, explain all of the discoveries acquired in and giving summary about it from the previous chapter alongside the response to the examination question. Ultimately, the creator will recommend a few proposals and conceivable outcomes for the investigations will be in the future around a similar subject.

2. Chapter 2: Literature review

2.1. Introduction

A literature search has been conducted to determine the state of knowledge in the term of glare studies related to the daylighting and how to get the benefits from it and how to get rid of the annoyance glare causes the discomfort for the users in the chosen zone. The glare from the daylight will be investigated in term of windows, buildings orientation, daylight glare metrics, area, reflectance, luminance proportion, glare probability during the day.

The argument made because of significant value choices will be break down in context of the daylight analysis, help from other studies and in conclusion in context of costs identified with what the proprietor theoretically needs to pay in returns over a year. Clashes from values choices are not the focal point of this paper but rather fascinating to perceive how it corresponds for the office zone in a commercial building. (Andersen et al. 2008).

The contention or relationship made because of significant value choices for this study is in the importance of results, where an answer or choice with respect to the visual comfort and daylight glare, therefore will influence the result while all are looking for superior of the results. The outcome of the building orientation or changing the position of the observer to get visual comfort may result in a decrease in daylight accessibility and so on. Consequently, there is a contention or relationship because of the choice (Andersen et al. 2008).

Daylighting studies recently has been increased more yearly, climate investigations by collecting the required information and showing it on three-dimensional charts, for example, useful daylight illuminance (UDI) or daylight autonomy (DA) or by consolidating information and showing it on charts. Most of yearly investigations looks into glare studied by (Wienold & Christoffersen 2006), they come up with the daylight glare Probability (DGP) standards utilizing a changed rendition of the software. since conventional glare assessments from pixel investigation are computationally serious, this exertion was encouraged by the improvement of an illuminance based direct estimate for DGP, while it made the yearly count potential, has a few impediments in high difference glare circumstances. (Andersen et al. 2008).

This study does not have analysis or examination of energy, footprint, sun oriented and life cycle cost investigation. Building envelope data and HVAC framework has not been incorporated into this paper. Concentration in comprehending visual comfort and daylight issues. Data about the envelope and HVAC framework is not pertinent for this study. An office room in a commercial building in Dubai will be presented and analysed in this thesis.

2.2 How others studied the Glare

Numerous analysts have contemplated glare metrics already in various ways and perspectives. They have been considered as far as vitality execution, occupant's comfort, and regular daylight. The strategies utilized are many, start from simulations, experiments and numerous different methodologies. In this part of the paper, numerous studies will be outlined to have a thought of what individuals have done before to think about new points in this thesis.

Sustainable design of the building has many aspects like climate change, global warming and daylighting of the building. Apart from this (Wienold et al. 2008) decided to investigate the building daylight ,since daylighting has been appeared to give numerous advantages to building inhabitants extending from improved production in office spaces and health, also increase lighting quality. In any case, the requirement of integrated system when light structure requires. Sunlight fluctuates in power, shading and bearing after some time. These varieties are one of the structure parameters, which are hard to adapt to since they greatly affect both the warm and the visual condition.

The objective of Jan Wienold and Jens Christoffersen in their study was to research the occupant's impression of sun oriented with shading systems in regards to glare by utilizing research tests in the laboratory with certain conditions, to contrast the existing glare rating conditions with the outcomes from the laboratory, also to introduce a new glare equation. In the test's ordinary office, review headings were explored to determine a solid glare rating. The study starts with Method of the user assessments. Stage one began with test facilities. Where the Research starts in the Danish building Institute (SBI, Denmark) and at Fraunhofer Institute for Solar Energy Systems (ISE, Germany). (Wienold et al. 2008)

Those two organizations did the analysis utilizing a similar strategy and under practically indistinguishable exploratory conditions. The examination was performed at every area in two indistinguishable trial rooms, first place with equipment and call it reference room, where the second room is called test room. The furniture in both rooms are same where it furnished with ordinary office furniture like disk, chair, computer and gest chair. The work spot was beside the window and subjects were situated 1.5 m away from the window. Just level board shows (Eizo FlexScan L565, worst case scenario self-luminance 190 compact disc/m2) were utilized.(Wienold et al. 2008).

The Danish research centre is situated in Hoersholm, north of Copenhagen. The research centre has two test rooms with south-orientation; also changing the orientation to the other three, direction can be easy and in the consideration. The rooms are orientated to the east by 7° in order to get the maximum light from the sun. The characteristics is identical photometrical in the first room (rwall =0.62, rceiling =0.88, rfloor = 0.11) and geometrical (3.5 m wide, 6.0 m profound, 3.0 m high), the other room has same characteristics. Front elevation was covered with glass curtain wall, the specification of the glass it is double glazing with U value of 1.1 W/m2 °C Low-E with a light transmission of 72%, and the transmission is 59% of the solar energy.

The German sunshine research facility is situated in the south- western piece of Germany in Freiburg. The test places are sited on the top of the Fraunhofer ISE place of business and they can be completely turned without limitations, which permits a wide scope of sun elevation to be contemplated, very free of the period. The two rooms have dim photometrical (rwall = 0.56, rceiling = 0.80, rfloor = 0.34) and geometrical highlights (3.65 m wide, 4.6 m profound, 3.0 m high). The good ways from floor to the suspended roof can be changed. The rooms have a curtain wall in the front elevation, and the coating is shading feature defensive double-glazing, U value of 1.1 W/m2 °C and the light transmission is 54%. In addition, the transmission is 29% of the solar energy.(Wienold et al. 2006)

Figure 1: Photographs of the Fraunhofer ISE test facility with the three window configurations (left: small window, middle: medium window, right: large window). The rooms can be rotated fully in order to be more or less independent on seasons to set up a defined (Wienold et al. 2008).

In the both locations in this examination, subjects were uncovered, to three various window plans ordinary for the present structure of windows in places of business. The window courses of action could be changed each 5 min, as the completely coated facade could be either partially blocked (little and medium estimated windows) like figure 1 on left side or completely uncovered (huge window). These three distinctive window sizes located in the middle point of the elevation, a medium rectangular window covering the width of the elevation all windows have same Hight from the base. Three distinctive shading devices were incorporated into the study so to have varieties in potential glare circumstances. All Venetian visually impaired frameworks were worked utilizing altered stepper engines associated with a LON bus in the sequence of guarantee a similar tilt edge of the braces in the two rooms. (Wienold et al., 2008).

Moving indoor, in order to calculate the reading of illuminance in both rooms. Reference room has five sensors from a hanger SD2 model, fixing in 0.85m above the floor on a metal stick.

To check that the two rooms had a similar illuminance level during the tests, they install at the same position in both rooms two sensors, a vertical sensor at a VDT screen confronting the subject and one sensor for horizontal illuminance is close to the subject. Fixing the vertical illuminance sensor on a tripod at a 1.2 m above the floor to know the vertical illuminance in the reference room at the estimated situation of the subject's eyes. At ISE each 10 seconds, the illuminance estimations were made. The illuminance estimations were made each 30 seconds at SBI. The luminance circulation inside the field of the subjects was estimated utilizing a calibrated scientific grade (CCD) camera from Techno Team (ISE: LMK 98-2 Luminance VideoPhotometer, SBi: LMK Mobile, both with a Nikon FC-E8 focal point, field of view (FOV) 183°). (Wienold et al., 2008).

The CCD camera was fixed with the vertical illuminance sensor calculating the illuminance in eye level. The outcomes computerized picture from LMK98-2 contained 1030 (vertical) by 1300 (Horizontal) pixels comparing to the same number of luminance range. The LMK Mobile contained 1024 (vertical) 1280 (horizontal) pixels. Both had amendment and the LMK98-2 had a unique range shifting from under 3 cd/m2 to around 10000000 X1.8 cd/m2 , also the scope of the LMK Mobile was 3–200,000 album/m2.The cameras can be controlled to analyse the collected data.

The conclusion of the paper done by J. Wienold, J. Christoffersen comes in the utilization of CCD camera-based luminance mapping innovation to calculate luminance indoor to the users view, gives an incredible possible to enhanced understandings the estimations and user reaction. In the author view, fundamentally to utilize the CCD innovation to evaluation. The CCD innovation make the previous process easier. The new assessment instrument evalglare can deal with these assessments and recognize, successfully, all conceivable glare sources inside altogether different lighting scenes. The device additionally empowers evaluations of conceivable glare issues with re-enacted RADIANCE pictures, and could hence be utilized at a beginning period in the building design. Utilizing the apparatus for this examination, we determined a few right now accessible glare expectation models and found that these records have a thin relationship with the discomfort glare reported by subject's set-up with three diverse elevations formats, two distinctive view headings and three diverse sunlight-based shading frameworks. Because of the above vulnerabilities with the present accessible glare forecast models, the proposed glare condition, called (DGP)", they utilize a mix of a current discomfort glare calculation and an experimental methodology. The assessment of the outcomes from the analyses indicates great connection between the DGP and the workers reaction. the new DPG as a dependable instrument in numerous office circumstances as per the author rats, since the model depends on 349 unique cases with in excess of 75 distinct subjects in two nations. Furthermore, the new predicted formula ought to be affirmed by extra evaluations. The model ought to be tried related to other sunlight shading frameworks. Additionally, extra parameters. In the examinations recorded rich informational index comprehending illuminance estimations indoor and outdoor, in excess of 13,000 luminance pictures, and replies to an extremely itemized questionnaire. The informational index gives adequate chance to encourage investigation. (Wienold et al. 2008).

Another study has been conducted by Mcneil, Andrew Burrell And Galen in 2016, studying applicability of DGP and DGI for evaluating glare in a brightly daylight space by using different methodology than the previous study, they use simulation process in order to analyse the DGP and DGI also, to assess VCP visual comfort probability in high luminance workspace. Choosing this methodology exhibited that regular discomfort glare measurements, for example, Daylight Glare Probability (DGP) and Daylight Glare Index (DGI) were insufficient for assessing glare in a high luminance space.(Mcneil and Burrell 2016).

They start the study with survey done on a certain office building in order to get the impression of the users from the office space about the glare and get the exact time that maximum glare occur. Farther more, the users guided them to expect a workshop work and related design of the zones with light measurement ranges. Ranges of the Illuminance were picked dependent on a survey done by the author. The DGP edges are what Wienhold depicts for class A (<0.35), class B (<0.40), and class C (<0.45) workplaces (Mcneil and Burrell 2016).

Additionally, utilized the light coefficient strategy in Radiance to create hourly renderings from a perspective confronting all directions (west, east, south and north). The centre of the space has been taken as a view point. Since the author accepted that users had 360° rotational adaptability, the most minimal of the four DGP values as versatile DGP for the perspective. Long periods of activity were from 8 AM to 10 PM, yet the author restricted the investigation to sunshine hours inside this range. In the simulation process, the author used daylight coefficient way in order to get the horizontal illuminance at 1000 points in the office zone. In the result of simulation process, the strong correlation between daylight glare probability and the horizontal illuminance. They found the scope of DGP qualities grow; however, the clear connection persists. As indicated by these outcomes it is beyond the imagination to expect to have a circumstance where horizontal illuminance is 10,000 lux and visual comfort as indicated by DGP is below 40%. experience demonstrates that conditions outside under a 10,000-lux overcast sky can drive the visual comfort. The DGP simulation results is unsatisfied as well as the DGI in term of simulation in bright place.(Mcneil and Burrell 2016).

Another study in the daylight and glare conducted by Marc Schiler and Karen Knezek (2016), they have published a paper with purpose of evaluate the potential of the daylight glare and the impressive research done in order to analyse assess glare and the ways to lessen the issues structure from a planning stage. Understanding that the glare is unique subject comes from understanding the issue, and individuals don't generally concur on what establishes glare. it is basic to clarify a comprehension of the current glare measurements and formulas; this is to increasingly exact glare assessment. using human subject study data in order to study their accuracy and consistency in daylight glare evaluation by. (Schiler 2009)

This investigation performs approval examines on five glare measurements including the probability indices and the index of Daylight Glare (DGP and DGI) that have been grown obviously for the issues of sunlight glare. A parallel human subject investigation has been achieved to gather abstract annoyance7 glare assessments. Furthermore, high powerful range imaging was utilized to catch and break down the glare scenes that were experienced by those human subjects. In excess of 450 sunlight glare scenes and overviews were gathered in an office setting. The information has been handled in Evalglare and hdrscope to acquire glare scores, and the outcomes were analysed and evaluated. The outcomes demonstrate just one or none of the five measurements accurately matches to the subject's assessment for each glare scene. This assessment examination study demonstrates that the five glare measurements have critical irregularity and error issues.(Suk et al. 2016)

exact assessments of the discomfort glare from the sunlight. Sources of artificial light were totally not taking on the confederation in calculating the visual discomfort delivered to the occupants known to be the sole aftereffect of glare, as opposed the source of artificial light glare contribution. HDRI was utilized to catch the visual data that was practised by human subjects. After that in the human Subject Study, six persons female and male were selected for the human investigation. No members with vision-related disease or visual impairment were incorporated into the investigation. (Suk et al. 2016).

Few subjects were picked rather than countless random subjects in light of the extraordinary attributes of sunlight glare examine.

The human subject examination to survey uneasiness glare issues was performed inside an office space at the University of Southern California. There is no outside visual preventive that is firmly situated to the workplace. it is a corner office with windows confronting southwest and southeast. Two flexible blinds in every window a venetian visually impaired. The condition of the office was chosen to permit progressively light inside the zone and to stay away from the extreme differentiation issues that can happen in the office with little opening windows.

The examination setting was utilized for the subjects and HDR photography, ’The room is 11'-3" high by 9'- 6" wide by 11'- 4" long’’ this is as per Marc Schiler and Karen Kensek(2016) . The tallness of the windows goes from errand stature (2'- 6" A.F.F.) to roof. A work area was found near the windows confronting southwest and southeast; a work area screen was set over the work area, before a southwest-confronting window. The four illuminance sensors and information lumberjacks were set up facing the window behind the screen, while the other one also facing the window but over the camera, the sensors on edges of the work area looking to the roof side. thirty seconds is the period of reading and recording of the lumberjacks from the sensors. The hardware was painstakingly adjusted and standardized preceding the examination.

The scene of glare was caught utilizing different exposures by a Nikon Coolpix 4500 camera and hemispherical fisheye focal point. Only 2 stops were taken to catch the dynamic scopes of human eyes by changing screen speeds as it were. The caught HDR pictures were then prepared in hdrscope and Evalglare to look at DGP, DGI, UGR, VCP, and CGI file scores(Suk et al. 2016).

Many caught glare scenes were investigated in Evalglare to figure glare assessments utilizing the five glare measurements. The glare scores from Evalglare were moved to thEbztjne apparent glare degree classes dependent on the glare score runs that were produced for each glare record. At that point, the glare assessment outcomes from each glare list were contrasted with the gathered human subject assessment information to see whether they coordinated one another or not.

Abstract glare assessment information was contrasted with the glare scores determined by the current glare measurements to check what glare measurements match best to the assessment for the no-task glare scene for completely open blinds or other blinds.

As per Marc Schiler and Karen Kensek,2016, the model helps the past finding that DGI and UGR can't be utilized for a glare scene with direct daylight. DGI assessments on this scene is amazing as it announced impalpable glare despite the fact that the sun is unmistakable in the field of view. For the roller dazzle scene, UGR matches to emotional assessment, as it assesses recognizable glare. DGP and DGI think little of the glare scene while VCP and CGI overestimate it. None of the measurements assesses the venetian visually impaired scene as impalpable glare, and every one of them overestimate the glare to be detectable, exasperating, or terrible contrasted and the abstract assessment.(Suk et al. 2016)

In the approve of analysing sunlight glare scenes, 450 scenes were studied by the five existing glare formulas and contrasted with reviews in factual examination programming. The investigation findings prove that DGP demonstrates the best assessment exactness among the five measurements when the personal assessments are utilized as the benchmark for deciding precision. Undesirably, the assessment exactness among the current glare measurements is too small to ever be trusted as the most noteworthy precision level is somewhat over half. The exactness levels of VCP and CGI demonstrates that these glare measurements are not proper for light glare investigation. DGI and UGR show marginally higher precision rates than VCP and CGI yet they are not equipped for breaking down glare scenes with direct daylight. This makes every one of the four glare measurements aside from DGP unseemly for sunlight glare examination. Other than the precision issue, the conflicting assessment issue found from the past investigation emerged again all through this examination of human subject information. Besides, each glare record demonstrates higher or lower assessment precision relying upon the glare levels and visually impaired states of a scene, showing between list irregularities. The discoveries may be pertinent just to a shut office with huge coating in an overwhelmingly bright sky condition. Further investigation is required to check the discoveries in an open office setting or a shut office with little coating. Further good ways from windows to human subject or a field of view parallel to windows ought to be likewise tried to check the discoveries. In view of the points of reference and current examination, it is prescribed to utilize DGP for sunshine glare investigation. It is additionally imperative to altogether check luminance circulations and levels in glare scene so mistaken assessments can be stayed away from. By and large, these discoveries can help clients of the current glare measurements to locate a superior comprehension of what they can anticipate from every one of the measurements. Furthermore, it will help building up a superior daylighting configuration process, which would make outwardly agreeable daylight conditions in structures.(Suk et al. 2016)

The focus of the paper was to reduce the discomfort glare comes from the direct sunlight, compare the other metrics, and come up with the best-case scenario and will help building up a superior daylighting configuration process which would make outwardly agreeable daylight conditions in structures.

2.3 Daylight luminance.

The essential metrics is valuable Daylight Illuminance; certain planners to assess the performance of the light in a certain zone utilize it. It fundamentally calculates how frequently the specific space accomplishes a sunshine illuminance inside a particular range during a time. Helpful Daylight Illuminance pursues an atmosphere-based methodology where estimations of the hourly sun and sky conditions are obtained from yearly atmosphere databases it also called useful daylight illuminance (UDI).

As per Nabil and Mardaljevic 2006, by utilizing useful daylight illuminance as a metrics, planners can get the illuminance levels that fall in the valuable range, the illuminance levels that goes beyond the helpful range and the illuminance levels fall in the range of the valuable range the useful range comes between (100lux and 2000 lux) .(Mardaljevic et al. 2009).

As per (Andrew McNeil and Galen Burrell,2016) they did an experimental to study DGI and DGP , during the study they noticed that the DGP has a direct relation with the vertical illuminance , they start studying the DGP equation, the vertical illuminance multiplies by a constant, which shows an obvious contrast with other equations and formulas of glare. Accordingly, the indication here says that the DGP consider as a disturbing when the surrounded lights is high since it causes discomfort, even though if the source of the bright glare was absent. They set the contrast-based glare as zero, so that they can obtain the reading of the vertical illuminance which is more than 4100 lux, that indicates that as long as the DGP is above 40% it reports disturbing. (Mcneil & Burrell, 2016).

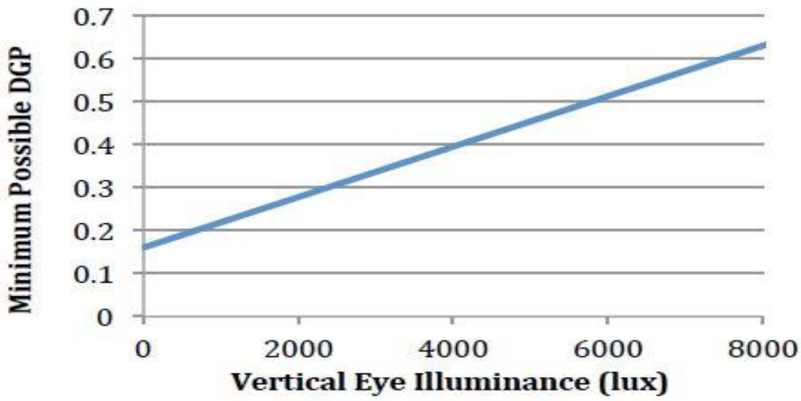


Figure 2: Graph illustrating DGP resulting from vertical illuminance assuming no contrast-based contribution to discomfort glare. (Andrew McNeil and Galen Burrell,2016).

2.4 Daylight factor.

As mentioned by Lechner (2015), "The ratio of daylight factor is the proportion of the illumination inside to outside on a cloudy day, which means that the viability of a structure in bringing sunshine inside". Various spaces with various usage require a certain factors 2% daylight factor is require in workplaces and study halls.

In contrast to illuminance, constantly used daylight factor for a specific plan for cloudy skies, which implies that as the open-air light changes the indoor brightening changes relatively (Lechner 2015).

The daylight factor (DF) is “the ratio of the daylight illumination at a given point on a given plane due to the light received directly or indirectly from the sky of assumed or known luminance distribution to the illumination on a horizontal plane due to an unobstructed hemisphere of this sky. Direct sunlight is excluded for both interior or exterior values of illumination” (Carlucci et al. 2015), and the formula is

$$DF = \frac{E_{p,obs}}{E_{p,unobs}}$$

Where:

$E_{p,obs}$= the obstructs the view of the sky the horizontal illuminance at a point P.

$E_{p,unobs}$= the not obstructs the view of the sky the horizontal illuminance at a point P.

2.5 (UDI) - Useful Daylight Illuminance

The useful Daylight Illuminance (UDI) is characterized as the part of the time in a year while horizontal daylight illuminance inside a certain zone. The higher and lower limit of illuminance rate are given in term of broke down analysing period into three receptacles: the little daylight with the time percentage so that its lower bin , high daylight with time percentage so that it's the upper bin when its drives to discomfort visual environment , and the moderate receptacle speaks to the level of the time with fitting illuminance level. (Carlucci et al. 2015).

The (UDI) formula is:

$$UDI = \frac{\sum_i (wf_i\, t_i)}{\sum_i t_i} \in [0,1]$$

Equation 1 useful daylight illuminance

Where: wf_i = weighting factor.

t = time

As per IESVE, The UDI is a metric where the illuminances are categorized into bands that are considered "useful" by occupants. These bands are, by default:

less than 100 - fell short

100 – 500 - supplementary

500 – 2500 – autonomous

and can be edited in post-processing.

2.6. Annual Sunlight Exposure and Spatial Daylight Autonomy

2.6.1 Spatial Daylight Autonomy (sDA)

This metric is telling the ambient daylight level if it is sufficient annually inside the building, in another word, the percent of an examination area which has a minimum illuminance of daylight level for a predetermined portion of the working hours out of every year in term of achieving indoor comfort environment.(Carlucci et al. 2015). The formula of sDA is:

$$sDA_{xiy\%} = \frac{\sum_i (wf_i \, DA)}{\sum_i p_i} \in [0,1]$$

Where:

x =illuminance level.

y = time fraction.

P_i= the points belonging to the calculation grid.

wf_i = weighting factor.

The estimation is performed surveying DA, in every purpose of a spatial lattice over the territory of intrigue, and after that solitary those focuses, with DA not minor than a given reference esteem, are incorporated into the summation, expanding the estimation of sDA.

As per mentioned in IESVE software the sDA is a metric depicting yearly adequacy of light comes from sun light in inside the place. It is characterized as the percent of an areas has been analysed and it comes near the minimum illuminance level for a predetermined portion of the working hours out of every year. It reports a level of floor region that surpasses a predetermined illuminance level, for example 300 lux for a predetermined measure of yearly hours, for example half of the hours from 8.00am to 6pm daily.

Preferred threshold: sDA300/50% ≥75% of analysis area

Nominally acceptable threshold: sDA300/50% ≥55% of analysis area

greater than 2500 – exceeded

The time chosen in the simulation as below because the author chooses the longest day in the entire year and the shortest day in the entire year Full year: 365 days - full 365 days.

Now days, the Spatial Daylight Autonomy (SDA) and Annual Sunlight Exposure (ASE) have been used as a sunlight metrics that can affect the daylighting credits (U.S. Green Building Council" 2017).

The scientists considered the (sDA) in terms of evaluate the nature of sunlight is another atmosphere metric that enhance the prescient capacities of the past sunlight measurements Also, the (sDA) decides the floor portion that gets a specific measure of illuminance per year. The figure below shows example of getting 50% of occupied hours per year by getting around 300 lux (Sterner 2014).

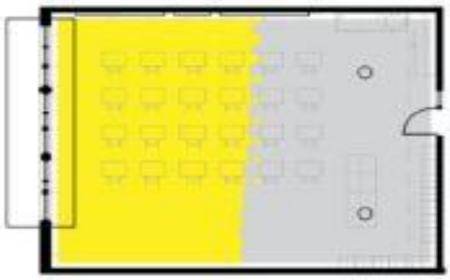


Figure 3: sDA analysis with analysis including shading and shelves (Wymelenberg & Mahić 2016)

For this situation, the above illustration demonstrates that 54.3% of the zone gets minimum 300 lux which means at any rate half of the yearly involved hours. Then again, the below illustration demonstrates the equivalent zone without outside shades and light retires.

The plane below demonstrates a weak light by receiving just 28.1% of the zone gets at any rate 300 lux for any event half of the hours yearly (Wymelenberg and Mahić 2016).

Figure 4: sDA analysis excluding shading and shelves (Wymelenberg & Mahić 2016)

2.6.2 ASE (Annual Sunlight Exposure) -

The ASE is a formula that shows the possibility into any zone of occurring visual discomfort. When the outcomes are going beyond the limit of the illuminance level in a certain hour, the result is a percentage of that analysed zone. The Annual Sunlight Exposure calculate the portion gets direct daylight and its percentage to the edge of starting generate the glare, such as the plane below demonstrates a weak light by receiving of the zone gets at any rate 1000 lux for in any event around 250 hours of the yearly occupied hours (Sterner 2014).

In the plans below demonstrates that the Annual Sunlight Exposure of a study hall with utilizing outside shades and shelves. It obviously demonstrates that the zone gets less immediate daylight yearly when including shading devices and shelves contrasted with the situation in the other plan while excluding shelves and shading devices. appeared below, just 10.1% of the study hall gets around 1000 lux for minimum in the entire occupied hours per year around 250. In any case on the other plan as below, 31.3% of the study hall gets around 1000 lux for minimum in the entire occupied hours per year around 250.

The situation in the second plan the glare will be generated in term of visual discomfort indoor environment and consequently the overheat will occur in such case.

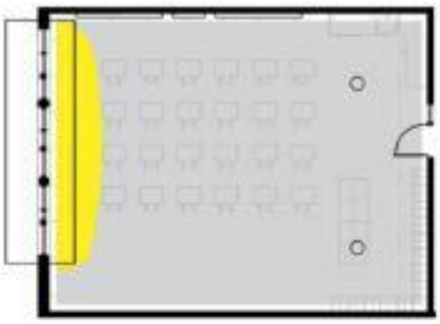


Figure 5: ASE analysis including shading and shelves (Wymelenberg & Mahić2016)

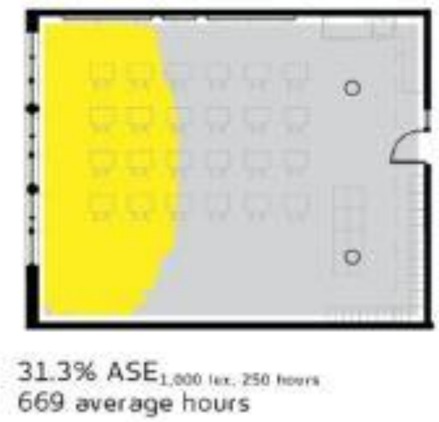


Figure 6 :ASE analysis excluding shading and shelves (Wymelenberg & Mahić2016)

2.7 LEED

The requirements of LEED in term of daylight is important when it gives extraordinary consideration to light because of its different advantages, for example, guaranteeing inhabitant's visual and warm relief. The fundamental point of including sunshine is to make an association between the inhabitants and the open-air condition just as lessening the electrical utilization through limiting the use of electricity and powered light.

LEED has three main points and the prerequisites to accomplish these factors are as below:

1- Manual or programmed glare-control devices is required for consistently utilised zones.
2- many options as below one of them is sufficient:
   a. Annual Sunlight Exposure and Spatial Daylight Autonomy Recreation used in simulation process by using computer and specific software like IESVE.

Each structure type has various necessities as far as sDA, as appeared in the Table below.

Table 1: Points for daylight floor area: Spatial daylight autonomy (U.S. Green Building Council 2016). (thaloob2017).

New Construction, Core and Shell, Schools, Retail, Data Centers, Warehouses and Distribution Centers, Hospitality		*Healthcare*	
sDA (for regularly occupied floor area)	*Points*	*sDA (for perimeter floor area)*	*Points*
55%	2	75%	1
75%	3	90%	2

Annual Sunlight Exposure ASE must not go beyond 10% and the work plane stature must be from completed floor level at 30 inches high of the normally area, this is an expansion to sDA.

Additionally, changeless components must be incorporated and portable furniture or allotments can be rejected in the simulation process.

b. Illuminance estimations in the simulation process as per U.S. Green Building Council 2016, utilizing computer simulation tools can be used in order to show the illuminance estimations. the time allotment among the daytime exactly from 9:00am to 3:00pm and the Illuminance levels should come in the middle of 300 lux and 3000 lux.

Point (1) in light to be accomplished, 75% of the study hall floor zone needs to accomplish the referenced illuminance average. In addition, to accomplishing points (2), 90 of the study hall floor zones needs to accomplish the referenced illuminance average.

c. Calculations, as per seen by U.S. Green Building Council 2016, field estimation alternative which is material for structures that are as of now built. LEEDv4 needs estimating the illuminance stages of studying zone with hardware, furniture and devices set up. Additionally, estimation will be done at a fitting work plane the time allotment among the daytime exactly from 9:00am to 3:00pm.

Moreover, the calculated illuminance should be between the ranges of 300 to 3000 lux. In the event that this illuminance range is in any event 75% of the routinely studying hall zone, this structure achieves 2 points in light and if the illuminance range is at any rate 90% of the consistently studying hall zone, the structure achieves 3 points.

2.8 Glare

The sensation inside the visual field created by luminance that are adequately more than the luminance to which the eyes are adjusted, which causes disturbance, or misfortune in visual execution and perceivability. (IESNA Lighting Handbook,2000)

Glare is the light or brightness comes from the reflection of the direct light or the high balance that affects the visual comfort inside any zone. Principles of the glare are two types, which are reflected glare and direct glare. The reflected glare is caused by the reflection of the direct light from the surrounded surfaces inside the space like walls, floors and furniture or outside the space like a ground and water surfaces. On the other hand, direct glare comes from either artificial source of light like indoor lighting systems or comes from the skylight or sunlight, which are natural sources of light. (Lechner, 2015).

Accomplishing a specific illuminance inside a space is not sufficient as breaking down glare and breaking down the sunlight, it makes a clear vision and superior comprehension about the presentation of a certain space in order to come up with best performance in the aspects of occupants and sunlight and calculating the glare discomfort probability occur. Appropriately, the plan can be changed in accordance with guarantee a superior for the two elements.

2.8.1The British Glare Index System.

In the 1961 IES standard has been introduced which was the primary glare assessment framework, this code has been created after the associated work between Pether bridge and Hopkinson in the period between the 50s and 60s of the last century. The framework depends on specific suspicions about the elements, which cause glare. To characterize extent of the inconvenience feeling, four different standards of unwanted glare: imperceptible, acceptable, uncomfortable and intolerable were utilized. On the idea of the two conditions connected to a one-glare source and numerous glare sources, many formulas of glare record respects were created(Carlucci et al. 2015). The two proposed formulae are as below:

Equation 1: basic formula for a single glare source:

$$G = \left(\frac{L_s^{1.6} \quad \omega^{0.8}}{L_b \;\; P^{1.6}} \right)$$

Equation 2: single glare source basic formula(Tuaycharoen 2006)

Where:

L_s = Luminance of the glare source (cdm-2)

P = Position index of the source which relates to its displacement from the line of sight

L_b = Luminance of the background (cdm-2)

ω= Solid angle of the source (sr)

Equation 2: summation equation for effect of multiple glare sources

$$\text{IES-GI} = 10\log^{1\circ} 0.478\ LG$$

Equation 3: summation equation for effect of multiple glare sources(Tuaycharoen 2006)

The minimum dependable noticeable change was one Glare Record unit and minimal contrast in Glare Index, which rolls out an important improvement in the level of glare, is three units, this indicates by Collins (1962). In 1967 (IES-London) has been published and the applications and proposals of the British Glare Record System, after that it has revised in 1985 (CIBSE). The extremity of the scale in the British framework is that larger GI's show growth in glare feeling. The framework is utilized in Scandinavian nations, South Africa, Belgium, Great Britain. (Nuanwan Tuaycharoen,2006).

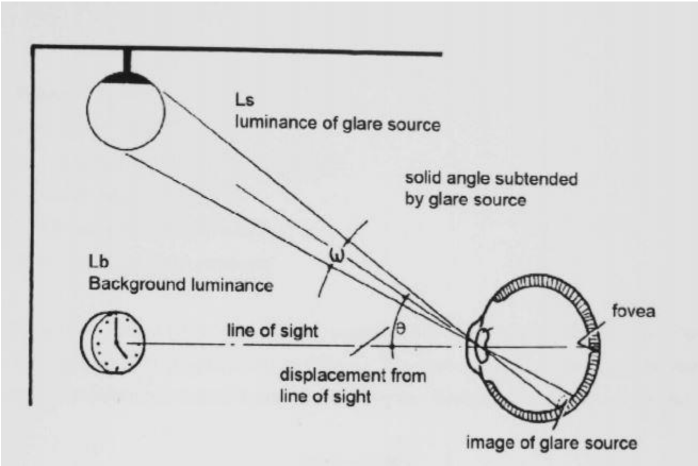


Figure 7:Main parameters in evaluation of discomfort glare(Tuaycharoen 2006)

2.8.2 The American Visual Comfort Probability Framework (VCP)

Guth, Luckiesh and Petherbridge and Hopkinson (1949) done free investigations in the U.S. to come up with The American visual comfort probability (VCP). The discomfort glare studies were started the improvement of VCP framework. Tests way was to assess the sensation and the feeling of the glare source when the source was quickly presented to see in the background-uniformed luminance. It driven their improvement of the single model to get the small thread between discomfort and the comfort. This abstract limit ratio has been compared with the British rating system in the Glare Index framework the point of just uncomfortable (Tuaycharoen 2006). Proceeded through a progression of examinations, Guth at last settled the accompanying collaboration between abstract glare sensation and his test parameters:

$$M = \frac{0.5\ L_s Q}{FP^{0.44}}$$

Where:

$Q = 20.40\omega + 1.520\omega^{0.2} - 0.075$

Ls = Luminance of the glare source (cdm-2)

F = Field luminance (cdm-2)

P = Position Index for the source

ω = Solid angle of the source (sr)

This formula is made to get the level of the glare for various glare sources in an establishment as well as the British Glare Index System. To get the discomfort glare rating system DGR the glare sensation esteems are created utilizing the accompanying condition:

$$\mathrm{DGR} = \left(\sum\nolimits_{n} \mathrm{M}\right)^{a}$$

Equation 4: daylight glare rating(Tuaycharoen 2006)

a = n-O.0914

n = the number of glare sources.

M = index of sensation for the source.

In order to calculate the Visual Comfort Ratings for indoor lighting the suggested strategy for processing was issued in the IES Lighting Handbook 1984 (Kaufman, 1984). The formula of the VCP is the final result of the American framework. The DGR can be changed over to VCP by two ways, first by utilizing a chart characterized in the IESNA Lighting Handbook or by utilizing the accompanying condition:

$$\mathrm{VCP} = \frac{100}{\sqrt{2\pi}} \int_{-\infty}^{6.374-1.3227\mathrm{Ln}(\mathrm{DGR})} e^{\frac{-t^2}{2}} dt$$

Equation 5: American Visual Comfort Probability formula(Tuaycharoen 2006)

Where: t = Time

d = diffuse

The formula speaks to the level of individuals who might acknowledge the lighting as agreeable under the characterized conditions. The IESNA prescribes that an establishment ought to be structured in the approach of keeping the VCP is equal or above 70%. The framework is utilized in US. (Tuaycharoen 2006).

2.8.3The German Glare Limiting System.

Improvement of the German Glare Limiting System depended on the few studies directed by many experts from Germany. As per these studies and depending on British Glare Index system, they come up with the summations of different glare sources utilized in the VCP. Examinations done by 10 to 15 person utilizing a seven-point glare rating size of distress glare sensation going from no glare, glare between non-existent and recognizable, glare observable, glare among perceptible and upsetting. (Tuaycharoen 2006).

Therefore, the experts proposed the luminance, which delivered discomfort regarding the connection between the Mean Glare Rating luminance, their emanation edge and the luminance of the illuminating presences. To maintain a strategic distance from the challenges in technique calculations, they changed the luminance bend strategy to be a glare restricting technique. The limiting system of the glare done by (Fisher, 1972) determine limits of the luminance for various lighting conditions and qualities (Tuaycharoen 2006).

The Glare Limiting framework is in a general sense unique in relation to the British Glare Index and the VCP frameworks. There is no state in this framework that characterizes the relationship between the parameters affecting the glare sensation and glare sensation, which, sees that the Glare Limiting framework is more confined being used than the British Glare Index. In any case, the Glare framework is harmed in various territories (Tuaycharoen 2006).

2.9 Daylight Glare Metrics and Indices.

Sustainability has various aspects one of them is represented in daylight which can be achieved by implementing the green building rating system such as UAE systems and worldwide like SAAFAT, ESTIDAMA, BREEAM and LEED and other rating system.

Sunlight is the complete brightening of a specific space came because of the mix of sun and sky, which are the primary common light source. Furthermore, metrics and light measurements are a scientific mix of estimations, conditions and measurements.

The motivation behind characterizing and understanding sunlight measurements is to unite a few factors that decide and foresee the sunshine execution in a particular space(Mardaljevic et al. 2009).

The benefits are various when using metrics of daylight and luminance; it consists in a various aspect when come the point of determining the sufficient light during the day and its availability.

The quality of the visual in the interior environment will be determined since it considered as a significant aspect, in the stage of designing the buildings. because different zones needs different light level as per its function, using the right metrics of daylight in some zones together to come up with the best luminance level which led to best visual quality environment and to prevent the main important issue which distract the occupants and reduce the efficient and productivity which is the reflection and glare.(Jakubiec and Reinhart 2010).

On the other hand, a space would qualify if an enough amount of light were obtainable. this luminance will be sufficiently obtainable just in some circumstances with some of the related features relying upon a few factors, for example, inhabitancy, errands performed in the space and least prerequisites given by nearby building guidelines.

Sunlight measurements will expect if the accessible sunshine would be the essential light source in the space or a counterfeit lighting is required.

As per DAYLIGHTING METRICS—Defining Successful Daylighting 2008, Sunshine configuration is viewed as productive and viable when it comes in the way of reducing the energy consumption and vitality request by lessening the yearly demand on the artificial light.(Wienold et al. 2008) .

the main glare metrics: $$G = \left(\frac{Ls^{e} \quad \omega^{f}s}{L_{b}^{g} \; f(\psi)} \right)$$

Equation 6:the main glare metric (Wienold and Christoffersen 2006)

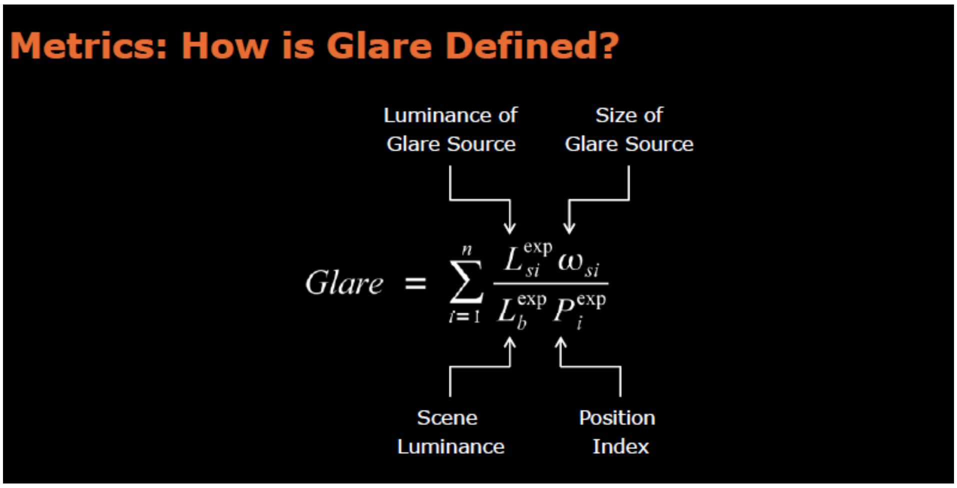


Figure 8: the main glare metric(Jakubiec and Reinhart 2010)

The description of how the glare metric works is come as per the Jakubiec and Reinhart they said increase probability of experiencing glare comes as a result from combining the factors like the larger source size, brighter luminance and more centred location in the viewing field. Probability of experiencing glare decreases from brighter average scene luminance.

Basic concept was fit to many databases with differing measurement and space criteria resulting in many different glare indices (Jakubiec and Reinhart, 2010).

2.9.1 Daylight glare probability (DGP)

The last formula that was created to assess daylight glare is DGP metric. In order to determine the glare, the metrics consolidates the vertical luminance with the glare formulas and its measurements. Additionally, the source of glare considered in term of its impact. Contrasted and the other existing glare indices, the daylight glare probability (DGP) demonstrates an extremely solid connection with the occupant's reaction in regard to glare observation (Wienold and Christoffersen, 2006).

On the other hand, the daylight glare index (DGI) was produced for the glare as it assesses a huge source of the glare, for example, high level of Windows's luminance (Bellia et al. 2008).

Another formulas and metrics ware created to solve glare matters brought about by artificial light such as CGI, VCP and UGR. Despite the fact that they are not intended for sunlight glare, a few investigations guarantee for the metrics the possibility of utilization of these measurements for daylight spaces (Isoardi et al., 2012). From now, every one of these metrices of glare were studied in this paper. the luminance pictures were programmed in term of glare assessment has been caught by High Dynamic Range Imaging (HDRI), the program Evalglare was developed by (Wienold and Christoffersen 2006).

The software Evalglare taking the threshold readings, in order to distinguishes potential glare sources. In that, approach the occupants can indicate physically as fixed values of luminance, moreover, by using the computer the decision comes based on the size of the glare source as seen by the observer, also by using the computer the decision comes based on position of the glare source as seen by the observer. (Inanici, 2004 and 2005). In Evalglare the threshold is as a matter of course a multiplier of the zone or the luminance in the image. (Marc Schiler and Karen Kensek,2016). this software "Evalglare" can be connected to a few daylighting programming it makes glare investigation simpler, yet utilization of it has not been generally expanded recently. Evalglare learns from a picture in either PIC or HDR several glare formulas and measurements in either a prospective image or hemispherical fisheye capture. Considering the data taken from a picture, Evalglare gives visual portrayal and glare scores of potential glare source size and areas. The table2 below shows varied glare indices of the five glare measurements to classify various degrees of saw glare either deplorable glare or imperceptible glare. Discomfort glare gives large numbers in the score in CGI, UGR, DGI and DGP. In contrast to the next glare measurements, in VCP the higher score speaks to better visual environment. (Suk et al. 2016).

The day light glare probability (DGP) has been identify with the equation below:

$$\mathrm{DGP} = 5.87\mathrm{X}10^{-5}\mathrm{E_v} + 9.18\mathrm{X}10^{-5}\log(1 + \sum_{i} \frac{\mathrm{L_{si}^2}\omega_i}{\mathrm{E_v^{1.87}}\ \mathrm{X}\ \mathrm{p_i^2}}) + 0.16$$

Equation 7: daylight glare probability metric(Jakubiec and Reinhart 2010)

Where: E_v = is the vertical eye illuminance, produced by the light source.

L_{si}^2 = is the luminance of the source.

ω_i = the solid angle of the source observed by observer.

p_i = is the position of the index.

The evalglare tool in the software's gives a presentation of the location and size of the analysed. The different scale of the five glare measurements illustrated in the below table to order various degrees of saw glare from intolerable to imperceptible. The worst case represents in higher score issues in CGI, UGR, DGI and DGP. In contrast to the glare measurements, the higher score says the better visual range in VCP. (Suk et al. 2016).

Jakubiec and Reinhart guarantee that DGP demonstrates the most vigorous outcomes for most sunlight circumstances among the five measurements (Jakubiec and Reinhart, 2010). In the same investigation discovered that VCP isn't proposed to be utilized for light glare figuring, and CGI will in general show a bet higher glare levels than different formulas. UGR and DGI is utilizing in the process of daylight glare assessment, yet when the daylight doesn't inter it doesn't work (Jakubiec, 2010). As per Hirming 2013.2014 studies, it guarantees that DGP and DGI were not able give exact assessments of distress glare experienced by the members (Hirning et al., 2013 and 2014). These past discoveries and rights on the utilization of the current glare measurements were required to be confirmed in this paper. Evalglare is one of the most suitable controllers for computing sunlight glare, however past study has demonstrated that the current glare measurements give conflicting glare assessments to an equivalent glare scene, that drives researchers wary of their assessment exactness's (Suk and Schiler, 2012).

The past examination was done completely without sources of info, in Suk and Schiler, 2012, paper they used human subject investigation information was performed to discover levels of precision and consistency of the formulas.

Table 2: Glare Metrics scales (Suk et al. 2016)

Degree of Perceived Glare	DGP	DGI	UGR	CGI	VCP
Imperceptible	< 35%	< 18	< 13	< 13	80 - 100
Perceptible	35% - 40%	18 - 24	13 - 22	13 - 22	60 - 80
Disturbing	40% - 45%	24 - 31	22 - 28	22 - 28	40 - 60
Intolerable	> 45%	> 31	> 28	> 28	< 40

2.9.2 Daylight glare index (DGI)

Hopkinson was created in 1972 DGI to account for enormous glare sources, for example, a window (Hopkinson 1972). The measurement depends on abstract appraisals from human subjects in a daylight office space. DGI is determined as the whole of glare commitment of each brilliant cause as pursues:

$$\mathrm{DGI} = 10\mathrm{X}\log_{10} 0.48 \sum_{i=1}^{n} \frac{L_{si}^{1.6}\,\omega_{pos.si}^{0.8}}{L_b + (0.07\omega_{si}^{0.5} L_{st})}$$

Equation 8: daylight glare index metric (DGI) (Pierson et al. 2018)

Where: E_v = is the vertical eye illuminance, produced by the light source.

L_{si}^2 = is the luminance of the source.

ω_i = the solid angle of the source observed by observer.

p_i = is the position of the index.

In addition, the DGI scale to determine if the glare is producing discomfort visual environment, and the table below shows that.

Table 3 : – Relationship between DGI and subjective glare ratings (Jakubiec & Reinhart, 2012)

SUBJECTIVE RATING	DGI RANGE
Imperceptible Glare	less than 18
Perceptible Glare	18 – 24
Disturbing Glare	24 – 31
Intolerable Glare	greater than 31

The DGI formula is comparative in structure to other glare equations produced for artificial lights, also involving the CIE unified glare rating system (UGR), the CIE glare index (CGI), farther more, visual comfort probability (VCP). Nonetheless, since artificial lighting for the most part includes littler sources contrasted with windows, these formulas mostly showing poor connection at the time of connected to the source of glare from the daylight. (Andrew McNeil and Galen Burrell 2016).

The luminance can be demonstrated based on DGI to drop as luminance increments. Obviously, daylight conditions will display a high luminance in the background, it can reduce the results of simulated DGI. The author will show that in a high contrast and the brightness condition, DGI never reports glare. The author speculates this happens since the foundation luminance in the denominator overwhelms.

2.9.3 Visual Comfort Probability (VCP).

Visual Comfort Probability (VCP) was acquainted to assess the level of discomfort glare and applied to all kind of lighting frameworks. This equation targets assessing the level of the number of inhabitants in observers who might consider agreeable a given glare condition delivered by a lighting framework for analysing purpose. The Borderline among Comfort and Discomfort (BCD is the measure the impression of glare brought about by direct light from light sources. Many equations are forming the VCP such as the form below:

$$BCD = 185.67 L_{vf}^{0.44}\left(w_{s,i}^{-0.21} - 1.28\right)$$

Where:

$w_{s,i}$ =the solid angle of luminance got from observer.

L_{vf} = the average luminance of visual field.

To calculate the VCP required calculation of DGR with glare sensation metrics to get finally the VCP formulation (Carlucci et al. 2015).

$$\mathrm{DGR} = \left(\sum_{n} \mathrm{M}\right)^{a}$$

Equation 9: daylight glare rating(Tuaycharoen 2006)

Where:

a = n-O.0914

n = the number of glare sources.

M = index of sensation for the source.

The DGR is a metric of discomfort that calculating the discomfort and the DRG value increases when the discomfort increases; it is also used in calculating the VCP. It is given by

$$\mathrm{VCP} = \frac{100}{\sqrt{2\pi}} \int_{-\infty}^{6.374 - 1.3227 \mathrm{Ln(DGR)}} e^{\frac{-t^2}{2}} dt$$

Where: t = Time

d = diffuse

The relation between the DGR and VCP is opposite when the VCP increases the DGR reduces the figure below shows the relation.

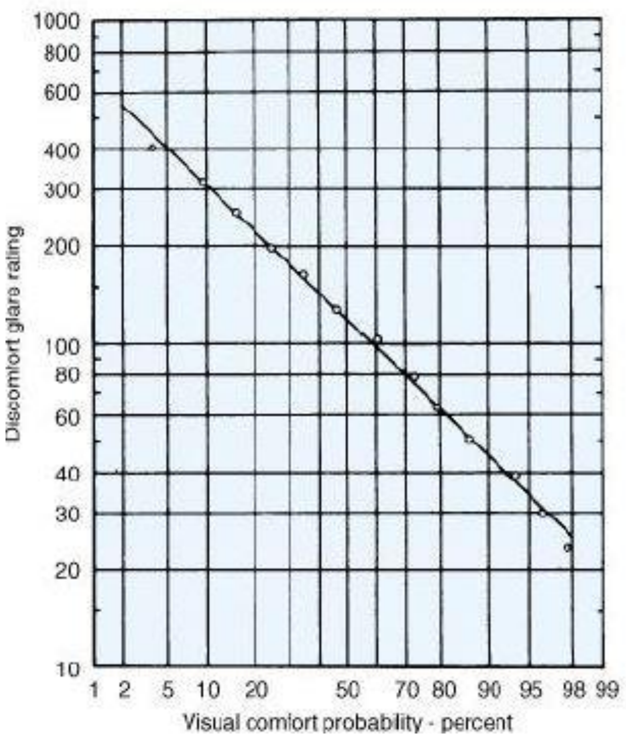


Figure 9: chart for converting VCP to DGR (the percentage of observers expected to judge a given lighting) (IESNA Lighting Handbook,2000)

The final VCP equation is

-Visual Comfort Probability

$$\mathrm{VCP} = 279 - 110\left[\log_{10}\sum_{i=0}^{n}\left(\frac{0.5L_{si}(20.4\omega_{si}^{0.2} - 0.075}{PX + E_{avg}^{0.44})}\right)^{(n^{-0.0914})}\right]$$

Equation 10:Visual Comfort Probability metric(Jakubiec and Reinhart 2010)

Where: L_{si} = is the luminance of a glare source.

ω_{si} = solid angle

P = is the Guth position index.

L_i = the luminance of the *i* part of the glare source in the eye direction, (in cd/m2).

ω_i = the solid angle of the *i* part of the glare source, (in sr).

p_i = the position index of the *i* part of the glare source (IESNA Lighting Handbook,2000).

2.9.4 CIE Glare Index (CGI).

The CGI Glare Index is to calculate the glare discomfort occur on the inhabitant indoor. This metric has four rating it evaluate based on the observer eye received the horizontal plane. First rating is intolerable, which means discomfort and the range is above 28. Second rating is disturbing, where the range between 22-28. third rating is perceptible and the range between 13-22, which means the occupant can tolerate it without causing discomfort. The last rating and the fourth one is imperceptible, which means it is below the sensation.(Carlucci et al. 2015) The formula of the CIE Glare Index as below:

$$\mathrm{CGI} = \log_{10}\left[2\,\frac{1+(E_d/500)}{E_d+E_i}\sum_{\mathrm{i-1}}^{\mathrm{n}}\left(\frac{\mathrm{L}_{\mathrm{si}}^{0.2}.w_{s,i}}{P_i^2}\right)\ \right]$$

Where:

E_d= direct angle of illuminance to the observer eye.

E_i = diffuse angle of illuminance to the observer eye.

$\mathrm{L_{si}}$ = is the luminance of the source.

ω_i = the solid angle of the source observed by observer.

$\mathrm{p_i}$ = is the position of the index.

Table 4 Relationship between CGI and subjective glare ratings (Carlucci et al. 2015)

SUBJECTIVE RATING	CIE Glare Index RANGE
Imperceptible Glare	Less than 13
Perceptible Glare	13-22
Disturbing Glare	22-28
Intolerable Glare	Greater than 28

In addition, as per wlenold,2006, he says that the CGI was produced it the approach of correction of the BRS mathematical equation, in order to calculate many sours of glare at the same time.

Furthermore, ‘proposed a unified glare rating system (UGR), which incorporates Guth’s position index and combines aspects of CGI and BGI to evaluate glare sensations for an artificial lighting system (restricted to sources with a solid angle of 3 X 10^{-4} to 10^{-1} sr)’’ (Carlucci et al. 2015).

2.9.5 Unified Glare Rating (UGR).

Recently the CIE has developed the (UGR). This framework is expected for discomfort glare expectation and is probably going to be usual by numerous countries. The IESNA is as of now considering UGR for future proposals. UGR form is. (IESNA Lighting Handbook,2000).

$$\mathrm{UGR} = 8\log_{10}\left(\frac{0.25\pi}{E_b}\right)\sum_{\mathrm{i=1}}^{\mathrm{n}}\frac{\mathrm{L}_i^2\ X\ \omega_i}{\mathrm{P}_i}$$

Where:

E_b = the illuminance on the plane of the eye from the background (excluding the glare source), (lux).

L_i = the luminance of the *i* part of the glare source in the eye direction, (in cd/m2).
ω_i = the solid angle of the *i* part of the glare source, (in sr).
p_i = the position index of the *i* part of the glare source (IESNA Lighting Handbook,2000).

2.10 Climate in Dubai.

The writer in this part will allude to the atmosphere database worked inside Integrated Ecological Solutions (IES-VE) programming to decide the atmosphere and the sun-oriented height of Abu Dhabi. Even though the study is planned to be for places of business located in Dubai, shockingly, IES just has the climatic information of Abu Dhabi, which is the capital, and it is close to Dubai. Since these two cities are close, the two urban communities have practically equal atmosphere and climate conditions consistently. Along these lines, the creator will allude to Abu Dhabi's atmosphere as Dubai's atmosphere. The two deferent days have been selected by author in the entire year and will be demonstrated in detail the 21st June as the longest day in the year and 21st December as the shortest day in the year.

It has a red-hot atmosphere, in summer it’s incredibly hot and moist the temperatures are high it may goes above (41°c) degree and in the evening time drop to achieve (30°c), then again winters temperature normal is (23°c) degree its short and warm in a similar time and medium-term drastically drops down till (14°c) degree. Precipitation, nevertheless, has been expanding in the last couple of periods with gathered downpour achieving 150 mm for every year. The atmosphere trademark in Dubai short and unpredictable precipitation as it is run of the mill for this territory. (Thaloob,2017)

Most of the precipitation during these two months is December and March. This period known by warm and it is viewed as the most pleasant climatic states in the entire year.

2.10.1 Relative Humidity

Figure below demonstrates that in Dubai the peek point of relative humidity among November and February. Then again, it is low in the period among the month March and the month of October.

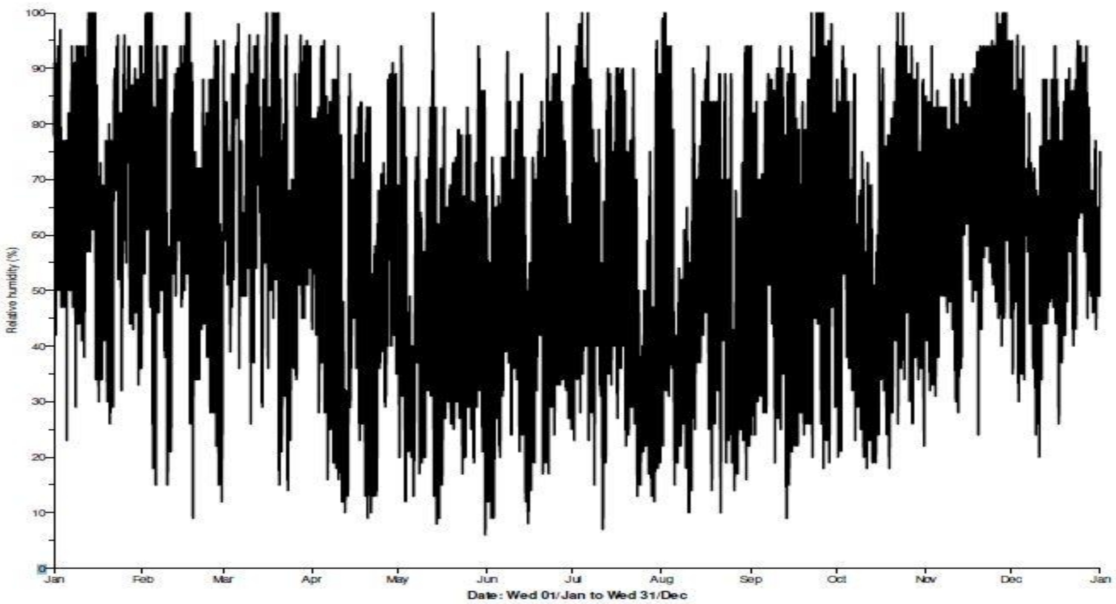


Figure 10: Relative humidity in Dubai throughout the year (climate consultant software)

2.10.2 Temperature.

The chart below demonstrates the changes in the temperatures in Dubai throughout the year, the hottest between mid-July and mid-August. While, the coolest temperatures are between December and January in this period.

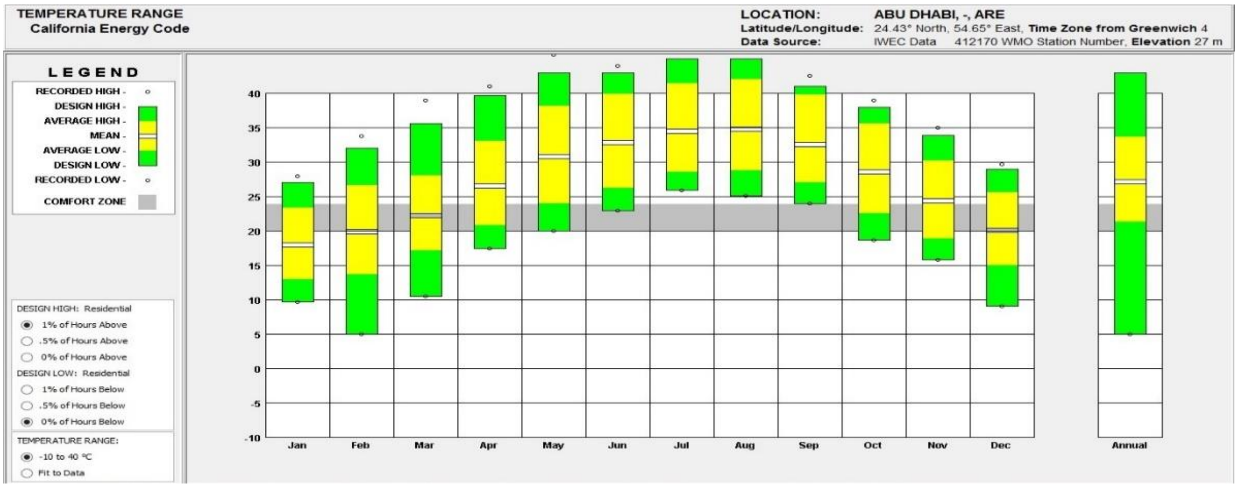


Figure 11: Temperature in Dubai throughout the year from (climate consultant software)

2.10.3 Altitude of the solar

The below chart demonstrates that Dubai and the UAE located under the altitude of the solar in the all days of the year. It demonstrates the sun at its least elevation between February and December. The sun at that point begins to get higher height beginning from the month of March and reach the peak in July and June.

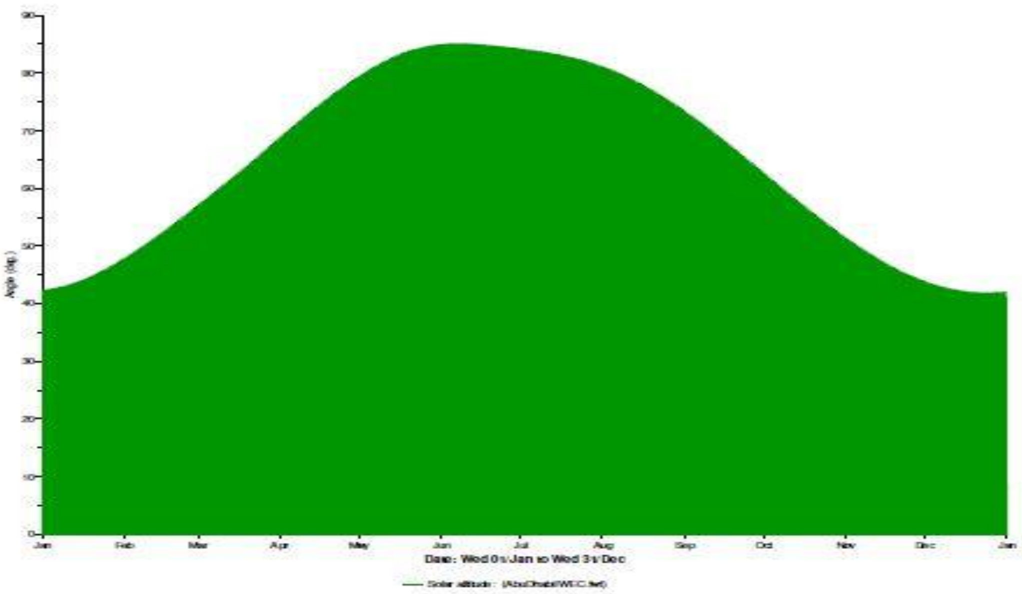


Figure 12: All year solar altitude in Dubai (climate consultant software)

In this part the two deferent days in the year June 21st and Dec 21st wither will be demonstrated by the author as below:

-June 21st:

This day is considered as the extremely hot and the longest day between the two picked days for this thesis. the below chart shows that during this day, exactly at 2pm in the day reach the peak in term of temperature where it achieves (41°C) which is excessively high, contrasted with December 21st. Then again, the temperature reaches the lowest degrees at the time between 5am to 6am where it reaches (26°C). In addition, with respect to relative humidity, the greatest humidity during this day from the entire year occurs where it achieves 74% at 12am and the lowest humidity percentage   is around 19% at 2pm. In addition, the most sun-altitude is 85° it is occurred at12pm.

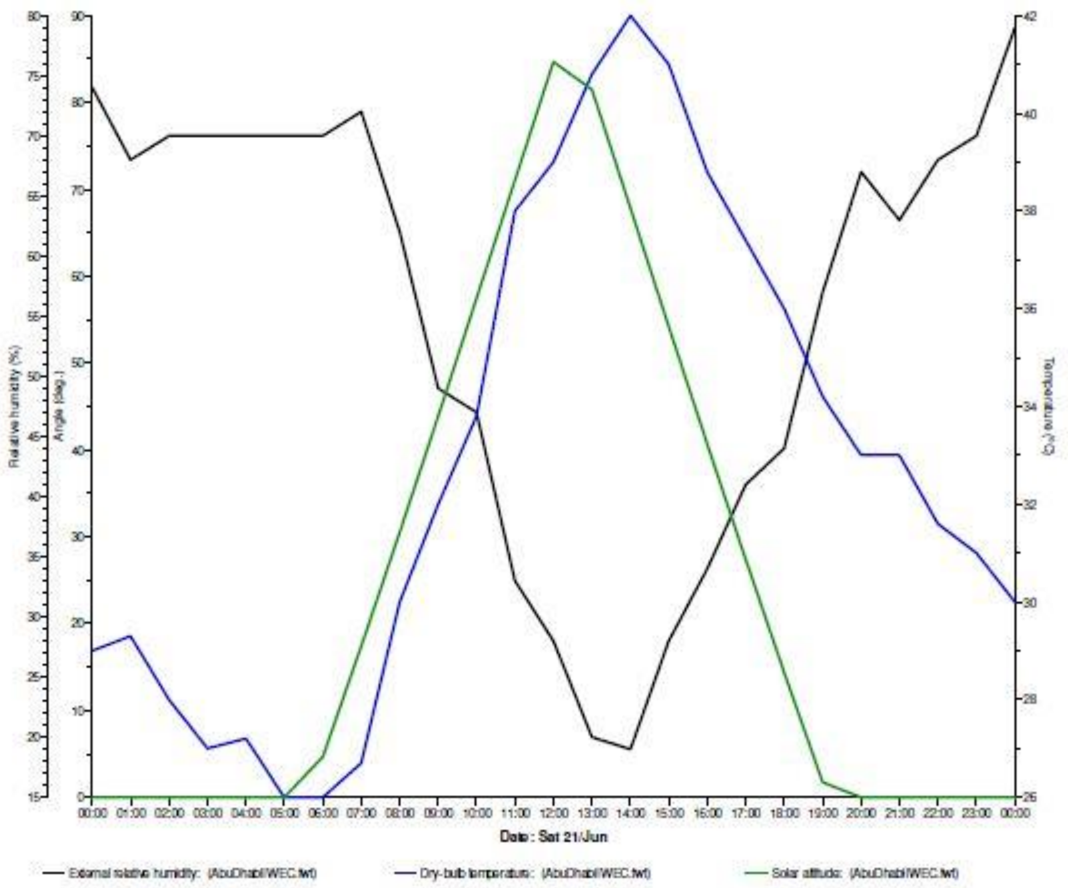


Figure 13: Solar Altitude, Temperature and Relative Humidity Dubai in Jun 21 (climate consultant software)

-December 21st:

This day is considered as the extremely coolest day in contrast to the other day. The chart below demonstrates that the peak degree which is the highest temperature occur is among 2pm to 3pm where it achieves 25°C. Then again, the temperature is at its most reduced in this day between 6am to 7am where it comes to as low as 17°C. In term of the humidity, during this day in the year, the greatest humidity percentage happens it comes to about 90% at 7 am.

However, the most reduced humidity percentage is between 2pm to 3pm it reaches 3%. Furthermore, the highest solar altitude is (41°) is occur at12pm.

The humidity is consistently conversely corresponding to the dry-bulb temperature. In addition, in June 21st the (85°) is the solar attitude which is higher in contrast with Dec 21st. on the other hand (41°) the solar attitude occurs in Dec 21st which is the lower in contrasted with June 21st. In expansion, it is seen that the sun-oriented elevation is always related to the dry bulb temperature.

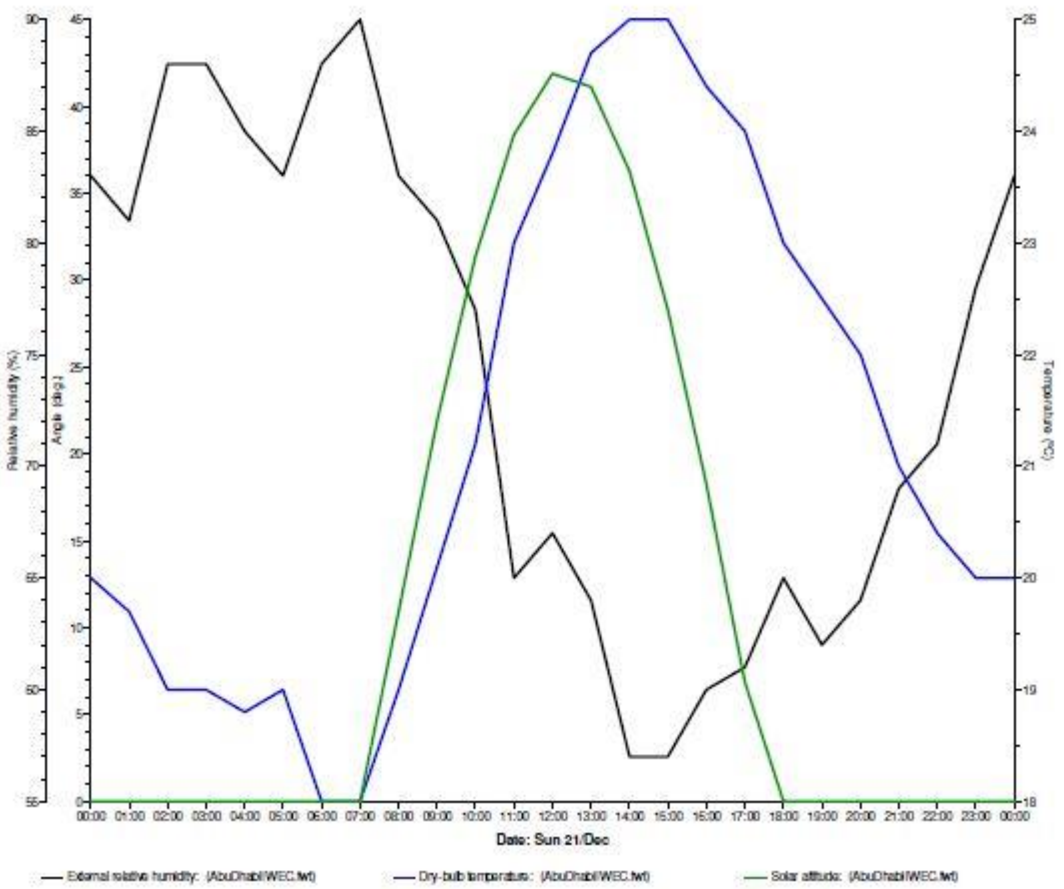


Figure 14: Solar Altitude, Temperature and Relative Humidity Dubai in Dec 21 (climate consultant software)

2.10.4 Precipitation.

The below chart demonstrates that in Dubai and in the UAE the rainfall is not so high it is rare. Moreover, it demonstrates that the high season and period of high perception in the inter year which is in February where the approximately days of rain is around 20 days, after that the lees rain month is December, where the approximately days of rain is around 10 days.

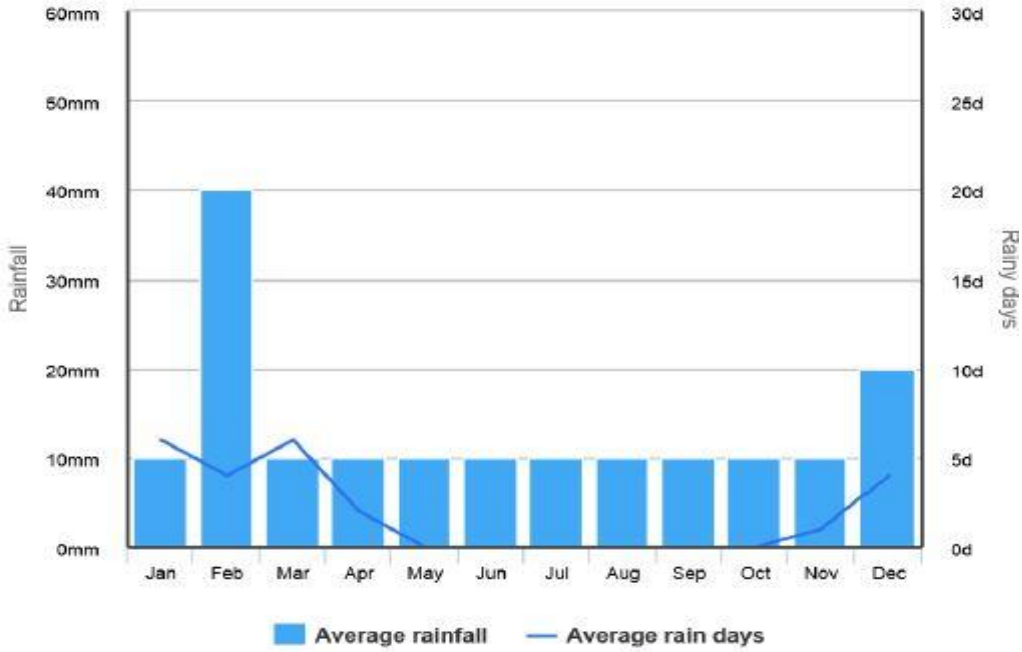


Figure 15: rainfall average in Dubai (climate consultant software)

2.11 Identification of the Problem

Glare is the consequence of undesirable light in the visual field. It is normally brought by the nearness of at least one source of the light. The glare has two unique parts. One part identifies with the degree to which a specific source of light meddling with an individual's capacity to play out roll, that experts can call it "disability glare". The subsequent one arrangement with the coming about inconvenience brought by the light source, called "discomfort glare". Inability glare is the part of glare that makes an immediate decrease in an individual's capacity see protests inside a visual field, without essentially causing irritation. This glare kind relies upon the size of the glare source, the illumination comes from the source, how far is the source from the eye, and if the visual field has the source of light inside. The discomfort glare incorporates, however is not constrained to, the impression of irritation and distraction, inconvenience. This sort of glare is by all accounts intensified of two impacts the saturation impact and the contrast impact. (Nuanwan Tuaycharoen ,une 2006.).

The source of discomfort glare either it is small or big they are regularly poor indicators of the abstract evaluation of discomfort glare, specifically, Hopkinson's light glare equation demonstrated a low relationship between the anticipated rate and the abstract reaction for uneasiness glare from windows (Manabe, 1976; Stone and Harker, 1973; Boyce, 1981; Hopkinson, 1970; Hopkinson, 1972).

This proposes window glare relies upon additional factors than the four epitomized in the glare count: position record; encompass luminance, source size and source of the luminance. The outside view is without a doubt an interceding or an upgrading factor. Noticed, from remarks by his witnesses, that a view with a lot of fascinating data expands his subjects' acceptance level of distress glare, this is as per Hopkinson (1972). (Nuanwan Tuaycharoen, June 2006.).

that "individuals every now and again sit for quite a long time before a TV by free decision despite the fact that it should, as per the equation, be delivering unfortunate glare". (Markus, 1994 cited in Boyce 1981; p. 313).

In view of the above proof, it tends to be seen that there are various creators who have called attention to that much of the time where a high luminance happens, enthusiasm for the glaring cause appears to change the annoyance sensation. showing the mental idea of the response to the interest for the glare source, in various scenarios. Thusly, it is sensible to make a general theory that, the higher enthusiasm for a glare source, whatever it might be, and the lower distress glare individuals will report**.** (Markus, 1994 cited in Boyce 1981; p. 313).

The investigations of abstract reactions to various kinds of view, specifically of the attributes making the ability of the view through a window desirable. As per the noised of Orians and Heerwageen (1986), the perspectives with prevailing nature substance are more satisfying than perspectives commanded by fabricated condition. In addition, the general discoveries about the inclination of sees from studies happened in Europe and the USA guaranteed that regular scenes are more favoured than those of the manufactured condition are and individuals favoured a total view that contains some portion of the sky and each zone of it, the center part, liked (Tregenza and Loe, 1998). inspected the stratification of perspectives by Markus; he contended that individuals will in general lean toward perspectives containing every one of the three level layers - sky, scene or cityscape, and adjacent ground - are liked to sees that incorporate just a couple of layers**.**

To know whether a fascinating perspective is lessening the glare from windows. In the approach to proof that even when inspecting the comfort physically, an absolutely psychophysical approach is deficient; and the convenience practically speaking of the window glare method would be extraordinarily upgraded if incorporation of see related elements improved their prescient power. In addition, the discoveries can be utilized as window plan rules to advance decrease of uneasiness glare from windows. The working spot is not just the lighting nature could be improved just as the inhabitant’s physiological needs be fulfilled, yet additionally the reducing from utilization of electrical vitality for electrical lighting can be expanded.

2.12 research Hypothesis and the approach of solving the problem.

The research theory can be summarized in reducing in the discomfort glare is directly related to a rise in interest in a glare source.

Because of confinement of time, this investigation tests this theory with a set number of instances of glare sources as it were. In view of the Hopkinson's supposition and the proof and advantages referenced over, this theory predominantly focuses on testing the intrigue impact because of a window. A theory for this condition is that "an expansion in a comfort in view field is related with a lessening in inconvenience glare from windows". In any case, testing this impact because of a genuine window is positively troublesome especially as far as setting up a trial condition and equipment and demonstrating a quantifiable impact due to generally uncontrolled factors. In this manner, the proposal started by testing the impact of the glare throughout the simulation method by using IESVE software.

2.13 Summary of the Literature review.

Table 5: summary of the Literature review.

Authors and date	Objective of the work	Methods used	Conclusion	Remarks
Sin Akleindienst, Marilyne Andersen,2008	yearly informational collection, made by parting the year into a small number of period and utilizing the ASRC-CIE sky model	Simulation and analysis	There is a relation between luminance date got from daysim software and the temporal map used in the annual period’s method.	

Ludde Gölén,2014	Visual comfort, high levels of natural light. Daylight Glare Probability, daylight availability, conflict, connectivity and glare.	research and analysis in software,	DGP not always gives accurate results in term of daylight comfort.	
Marc Schiler and Karen Kensek(2016)	exterior glare, visual discomfort, building envelope,			
Wienold & Christoffersen 2006	adequate daylight levels while avoiding Glare and excessive heat gain help in identify the glazing properties	experimental rooms	The new DGP comes from combining new metric and the normal DGP after camera experiment	
(Lechner, 2015).	Heating, Cooling, Lighting, Glare, Sustainable Design Methods for Architects 4th journal			book
Moreno, María Beatriz Piderit Labarca, Constanza Yañez,2015	Integrates the daylight variations to know the annual lighting performance to compare their performance	Data collection, simulation	Finishing materials is important for energy saving	
(Mardaljevic, Heschong and S. Lee 2009).	Analyse the relation between the UDI and the predicted annual occurrence of glare.	experimental rooms analysis	"The relation between L95% DGPs and the two UDI metrics seems sufficiently robust to warrant further development of this approach."	

3. Chapter3: Research Methodology

3.1 Research Methodology

Work methodology is to know the fundamental points before getting start in the analysis stage which conduct to the strong approach .by taking in the confederations some ideas and stages of designing methods to come up with the best results.

A high accessibility of daylight levels in an indoor situation could be a detriment for the ideal visual conditions, not just for mental responses because of an overabundance of daylight, yet in addition for the fluctuation of the attributes of light amid the time

Methodology will be conducted in the context in this study and it will lead to implement points to end up with the best results as follow:

Simulating the model in software to come up with the results choosing the time between the months of April and September, which has the maximum light and clear sky. This led to know the sky conditions and the distributions of the light and the intensity.

a case study which is an office room in a commercial building located in Dubai. And its size and the colour of the internal wall's variables

The author will choose deferent sizes of window and deferent blinds will be used in the experiment or the simulation to come up with the best result.

Calculate the problems of discomfort glare and daylighting by Using

-daylight glare metrics and other metrics.

The expression indicates to the best approach to purposely take care of the problems of the research. Generally, the methodology enables the analyst to separate the means required to infer the issue explanation and come up with an answer dependent on the rationales included. This chapter gives a brief around two of the most utilized research strategies in the field of daylight glare, after that a depiction and thinking behind the chose will be followed.

The chosen methodology will be justified well after being demonstrated. The variables in this study have an effect on the study model, which can be measured in deferent scenarios and deferent parameters. Different research approaches that were used in order to analyse the daylight glare, the author will list some of them.

3.2 The Glare Metrics

3.2.1 Daylight glare probability (DGP)

"The probability that a person is disturbed instead of the glare magnitude" [Wienold and Christoffersen 2006, p. 753].In the IESVE software 2019 ,the daylight Glare Probability (DGP) is another formula for assessing glare which helps the connection with analyser evaluations Jan Wienold has developed at the Fraunhofer Institute for Solar Energy Systems in Freilurg, Germany. The Radiance module evalglare was made to create these measurements from a hemispherical fish-eye Radiance luminance picture. (Andrew McNeil and Galen Burrell 2016).

The DGP is Created in 2006 by Wienold, DGP is to show that the probability of dissatisfied of the inhabitant will be with the visual condition (Wienold and Christofferson, 2006).

The DGP formula was created utilizing abstract reactions from 349 experiments in an edge office with three window sizes furthermore, three concealing frameworks. DGP is maybe viewed as the best luminance-based measurement for evaluating distress glare from light; however, it likewise is known to have weaknesses. (Jakubiec and Reinhart 2016)

$$\mathrm{DGP} = 5.87\mathrm{X}10^{-5}\mathrm{E_v} + 9.18\mathrm{X}10^{-5}\log(1 + \sum_i \frac{\mathrm{L_{si}^2}\omega_i}{\mathrm{E_v^{1.87}Xp_i^2}}) + 0.16$$

Equation 11 : Daylight glare probability (Jakubiec and Reinhart 2016)

Table 6: Relationship between DGP and subjective glare ratings (Jakubiec & Reinhart, 2012)

SUBJECTIVE RATING	DGP RANGE
Imperceptible Glare	less than 35%
Perceptible Glare	35% - 40%
Disturbing Glare	40%-45%
Intolerable Glare	greater than 45%

3.2.2 Introduced Metric

Others have studded numerous discomfort glare metrics and daylighting glare metrics with different tools. Previously to give the ideal number of light amounts in order to prevent the discomfort visual environment into the structure. Significant research has been done to look at how to assess glare and how to tackle the issue for structure starting from the planning stage.

In the fact the issue is the way that glare is phenomenon that can be used either in the good way or leave it to cause a distraction and create a discomfort environment, and individuals don't generally concur on what establishes glare. For progressively exact glare assessment, it is basic to make a reasonable comprehension of the current glare measurements and instruments.

The author is going to develop some of the metrics in order to come up with the best results in the approach of comparative between daylight glare metrics, the threshold, daylight glare probability, daylight glare index.

The introduced metric is going to identify the difference between the glare threshold, and the incident glare occur in the certain time. and get the percentage of the difference, the author will call it the Glare Threshold Differential metric (GTD), it calculates the different number between the incident glare occur in the certain time and the threshold at the same time divided by the same threshold at the same time multiply by 100 to get the percentage of the GTD.

$$GTD = \frac{(\mathrm{L}_m - \mathrm{TH})}{\mathrm{TH}} \times 100 = \cdots \%$$

Equation 12 : The Glare Threshold Differential metric (introduced metric by author)

Where:

L_m: Maximum luminance occurs.

TH: is the glare threshold in the certain time.

3.3Types of research methodologies

Numerous kinds of strategies that assistance to figure hypotheses and give exact outcomes. particularly, when settling on an exploration strategy in order to determine the results in regard to the most suitable and avoid discomfort light with lighting controls the author think about the accompanying these techniques: computer simulation technology, daylight glare metrices calculations.

3.3.1 Chosen methodology

Computer simulation will take the most work in this paper as per the author decision in order to achieve the best results. The following are a few reasons behind why picking such methodology will be profitable for this examination zone:

1- The simulation process will be used in the computer and it gives a space to use many study models cases in with many variables also it permits assortment of structure alternatives and situations to be tried because of its adaptability in changing and rotating the limitations. In particular, it can simplify the exchange the direction of the source and the direction of the observer and test their execution during various occasions of the day. Additionally, far off areas can be effectively recreated by indicating to the implicit atmosphere databases instead of test strategy, which may expect going to the area important to test the examination under any conditions.

2- In order to achieve cost efficient, the simulation can play a role of doing the work with less cast compared to doing an experiment in a certain location rather than utilizing some other strategies, where it requires obtaining costly apparatuses or potentially types of devices. In particular, this technique will principally it is only the cost of obtaining the programming and likely outer hard drives for capacity and restoring aims.

3- In term of time reducing time and efficiently the simulation play the main role in term of period proficient strategy instead of different strategies, for example, field calculation approach that can require a few site visits to break down a few situations under various circumstances. In spite of the fact that this technique has different focal points, it additionally has its restrictions, for example,

A- Different structures in the simulation process, needs computer with unique specifications and performance in term of RAM, process unit, monitor resolution and other options required which might be very sheep in comparing with sites visits for experimental purposes.

B- The outcome achieved from this process may be incorrect, or a bit far from the accuracy. Moreover, may require approval and validation utilizing different techniques, the metrics and formulas can be used since there are natural possibilities and theories by the scientific models utilized inside the software in the simulation process in order to validate the results n that are utilized by the analyst to disentangle the issue.

3.4 Simulation Method

The computer innovation has extended against every single anticipated bound. Presently ready to produce exact outcomes dependent on entered parameters. Researchers are using computer simulations along with other methods in order to come up with the accurate results. Reinhart and Fitz, 2006 has conduct a survey demonstrated that about 77% of researchers utilized for their expert practice the two methods of simulation and physical model. Software technologies become a main part of research in the educations particularly in engineering due to the accurate results and time saving.

There are two main types of computer simulation. First category is the physical simulation, which is the actual items, are changed with physical items and the simulation occur and connected on these models. Second category called interactive simulation, which is related to the integration, comes from the interaction between the physical model or object and the human body. the simulation in scientific purposes use the technology in order to provide best results which means it creates best results an accurate presentation of the simulated object under deferent conditions.

3.4.1 Chosen software in the simulation process

In this stage, the Integrated Environmental Solutions (IES-VE) has been chosen by the author work on the analysing and to carry on this thesis. The software is an incredible and very useful where it empowers researchers and designers to test different alternatives and structures to think of the best plan choices as far as the daylight is the approach of the study.

The IES-VE software has been considered as capable software in term of simulation where researchers can get through the IES-VE the study of vitality and power cost reserve funds that meet government charge impetus necessities for business structures, this is as per The U.S. branch of Energy. In addition, they have recorded different qualifications that the IESVE can accomplish, as below:

-daylight simulations.

-natural ventilation simulation.

- Heat loss simulation.

- Mechanical ventilation simulation.

-Determine the glare from natural light and artificial light

- Determine water use by inhabitants for local employments

- Determine water use by warming, cooling

- Vitality frameworks can be determined

Thus, numerous different usages in the IESVE software can be determined. Furthermore, the product has a few modules for different purposes, the principle segment is as per the following (<VE> MODULE TUTORIAL n.d.):

a- Micro Flow:

In this part of analysing is in charge of examining the air development inside the study model. The results are introduced in computational liquid elements, which is amazing in term of evaluating distinctive forms of the air and dispersions.

b- Radiance:

In this part of analysing is in charge of sunlight investigation such as flucsDL in point below. Yet, to get rendered and photorealistic values of the re-enacted item, so utilizing Radiance will be must in the simulation process.

In addition, rendered outcomes can be displayed to demonstrate the luminance and illuminance on the process, in case assuming additional geometric is needed.

In term of indoor visual comfort, glare investigation is obtainable by utilizing this module to anticipate the daylight glare probability (DGP) and daylight glare index (DGI) and so on.

c- FlucsDL:

In this part of analysing, the daylight is the focus of this module. In this module, in term of indoor visual comfort glare investigation is obtainable by utilizing this module to anticipate the daylight factor and illuminance on any condition of any zone dimensions and configurations.

d- ApachiSim:

In this part of analysing is in charge of examining different thermal in the approach of obtain the heat in the simulated zone. It empowers dynamic collaborations between the structure loads inside, whether outside the building, mechanical framework and more aspects required in the investigation. Any user can simulate lighting gain, solar gain, people gain, heating load, cooling load and other aspects. Furthermore, incorporating many data from different modules, for example, SunCast Module is important while required any simulating the solar and the daylighting.

e- SunCast:

In this part, analysing the solar gain and the results is obtainable in this module; it is in charge of investigating the sun-oriented addition power on the structure relying on the area or region that the simulation will occur on. Besides, it can assist the visualizing the effect of the sun and its radiation sway on the exterior and inward surfaces of the structure.

f-ModelIT:

In this part of analysing is the in charge of displaying geometries. Different plans can model either it is simple or has many details. In addition, designs made by other programs can be effectively brought into IES-VE. Like SketchUp, Revit and AUTOCAD drawings.

3.5 Scope of Work

Here to say what is the scope of work. As per the author, (IES-VE) software will be used to break down the different daylight illuminance in deferent days in the entire year and deferent orientations the building as well as the observer as far as sunlight and glare execution for an individual office in Dubai through utilizing (FlucsDL) option in the software.

The outcomes and the results got from analysing the daylight and glare in a certain position will at that point be contrasted with the sunlight and glare execution when utilizing another position accordingly. Particular, the focus will on be preventing the direct reflection and the indirect reflection of the direct sunlight and increase the useful light got from the direct and indirect sunlight, the helpful sunshine and limiting the infiltration of direct daylight into the workplace.

This investigation is not expected to analyse windows and blinds or glazing performance and materials used in the building, as they are not in the extent of this exploration. Additionally, equipment, furniture, occupants, and different elements will be neglected in the process of simulation, it will be considered as a constant figure.

3.6 Research parameter:

A- Climate and location

In this study the climate will be (hot humid) where the location is Dubai United Arab Emirates the purpose behind fixe this parameter is to come up with the glare analysis in particular climate.

B- Date and time

In this parameter the author prefers to fix it in order to get a correct result and the time will be between 8 am to 16 pm while most of the offices are occupied with the employee in Dubai at this time.

Analysing the daylight glare in two deferent days which are 21 JUN and 21 DEC and the time will be three times per day, in the approach of analysing the time will be 9,12 and 15.

C- Room configuration

The office room will analyse in computer simulation software in the same location and climate mentioned above. In the simulation process, the author will have three different shapes of windows with different configurations in order to come up with deferent results to determine the amount of daylight penetrates the room and obtain the glare indoor to get the comfort level.

The dimensions of the office room (30m length X 15m width X 3.7 Hight) with area of 450m^2. The glazing will be on one side, there are three types or shapes of the windows in one side and the simulation will be conducted and have three different scenarios.

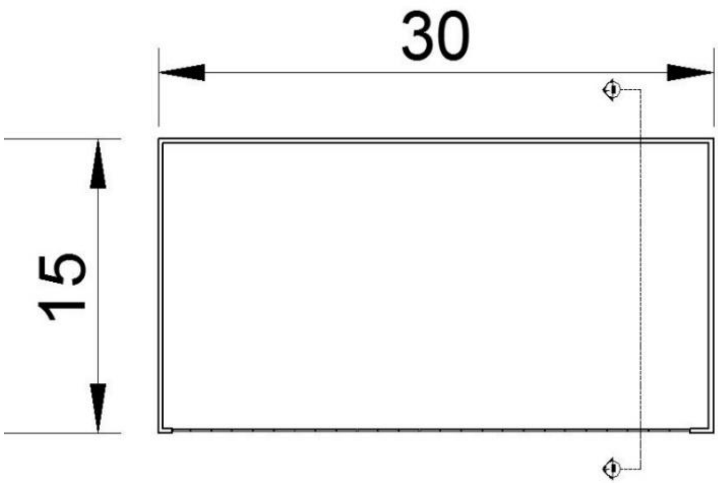


Figure 16: office room plan

Figure 17: office room section

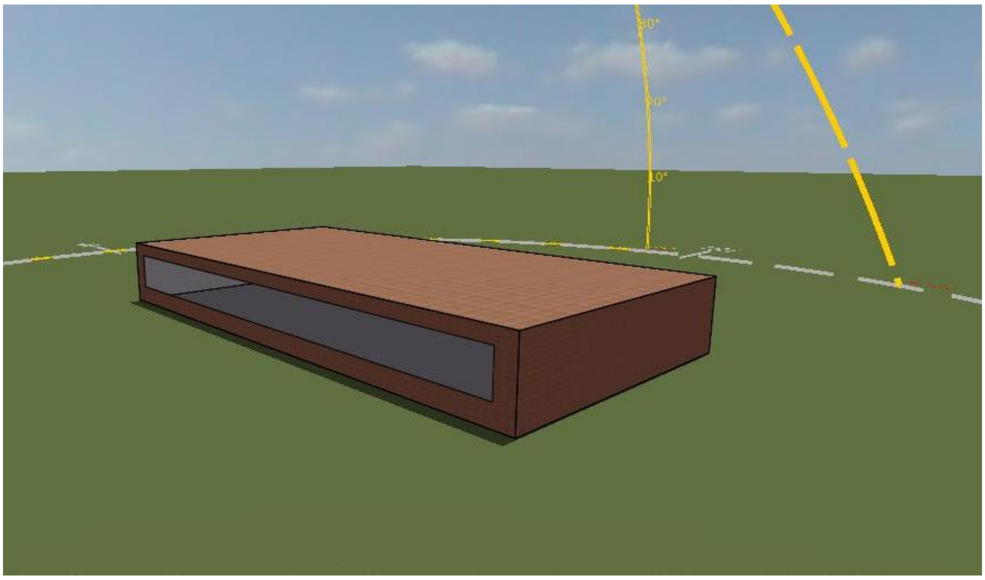


Figure 18: office room prospective

D – Observer Position.

The observer has four position in the room to restive the sunlight, this approach is to obtain the glare effect and calculate the glare comes in each position. The author will fix a sensor in each position in the simulation process.

Position 1: the observer in the centre of the office room faces the wall and the window opining will be on his left side.

Position 2: the observer in the centre of the office room faces the wall and the window opining will be on his back.

Position 3: the observer in the centre of the office room faces the wall and the window opining will be on his right side.

Position 4: the observer in the centre of the office room directly will face the window opining and the distance from the window to the observer is 7m.

Position 4/1.5m: same as position 4 but the distance from the window to the observer is 1.5m.

Position 4/3m: same as position 4 but the distance from the window to the observer is 3m

Position 5: the observer in the right edge as demonstrates in the figure 18 facing the south and the window opining on the left hand.

Position 5/1.5m: same as position 5 but the distance from the window to the observer is 1.5m.

Position 5/3m: same as position 5 but the distance from the window to the observer is 3m

Position 6: the observer in the left edge as demonstrates in the figure 18 facing the north and the window opining on the right hand.

Position 6/1.5m: same as position 6 but the distance from the window to the observer is 1.5m.

Position 6/3m: same as position 6 but the distance from the window to the observer is 3m

The positions will be as shown in the below figure.

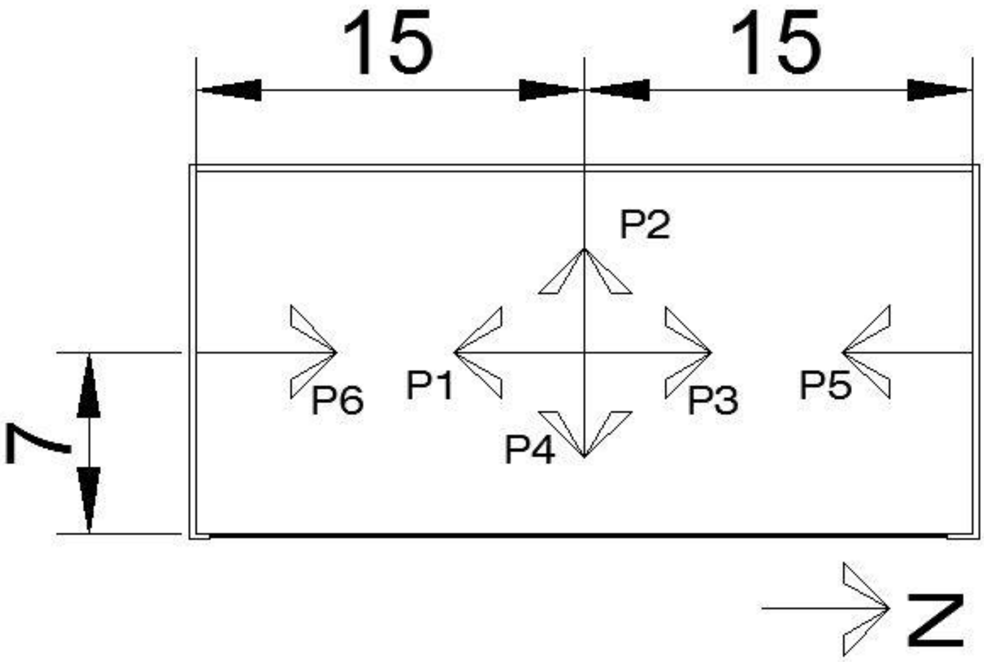


Figure 19: plan to show Observer Positions and eye view

E- Orientation

The side of the building, which has the window will face deferent orientations as a variable South, North, West and East, which means the author will have four main scenarios based on the direction of the window.

F- Window Shape

The author will introduce three shapes for the window opining on the same side in order to control and calculate the amount of the daylight penetrates the room during daytime. This means the number of the simulations will increase due to have three more scenarios.

Shape 1: has the window configurations, the size is 2m height 28m width and the base will be 1m Height, from the floor as shown in figures below also the distance from the window to the edges is 1meter.

G- Materials used in model

The materials used in the model will be fixed in all scenarios to come up with an accurate result as the most common finishing materials used in such climate.

Table 7: Materials used in the study model (Thaloob, 2017)

Parts of building	Finishing layers	Reflectance
Glazing	Total U-Value = 0.1849 W/m2k 6mm Inner Pane 12mm Cavity 6mm Outer Pane	Glazing Transmittance = 0.7
walls	Total U-Value = 0.4086 W/m2k 20mm Plaster 100mm Reinforced Concrete 50mm insulation 100mm Reinforced Concrete 20mm Plaster	50%
Ceiling	Total U-Value = 1.7310 W/m2k 12mm Plasterboard 50mm Cavity 100mm Concrete Deck 0.1mm membrane 150mm insulation	80%
Floor	Total U-Value = 1.7310 W/m2k 10mm Timber Flooring 30mm Screed 60mm Low Weight Concrete 150mm Reinforced Concrete	20%

H- Sun path.

Two days in the year will be selected in order to analyse the daylight glare in the longest day in the entire year and the shortest day in the same year.it has deference in the angel of the light source and light penetration into the office room.

In the JUN 21st

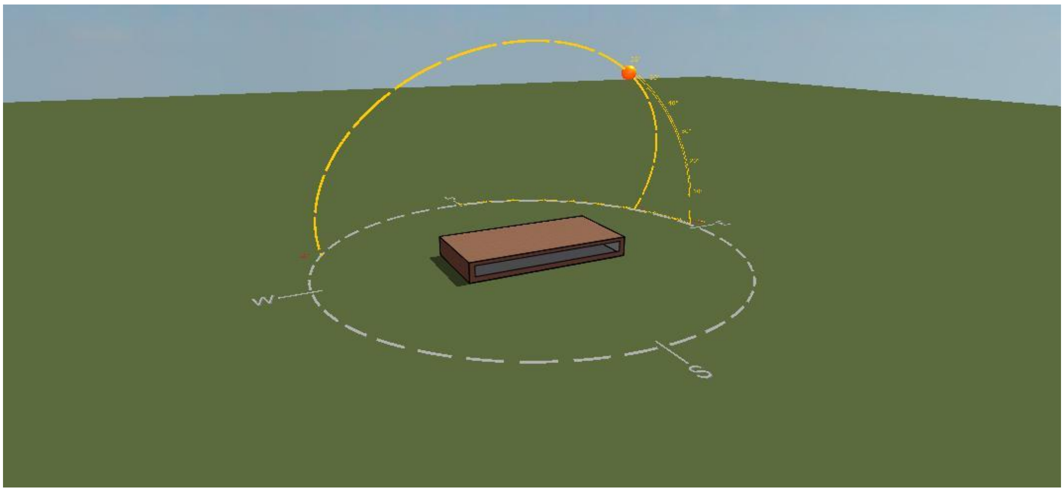


Figure 20:21-JUN sun path.

In the DEC 21st

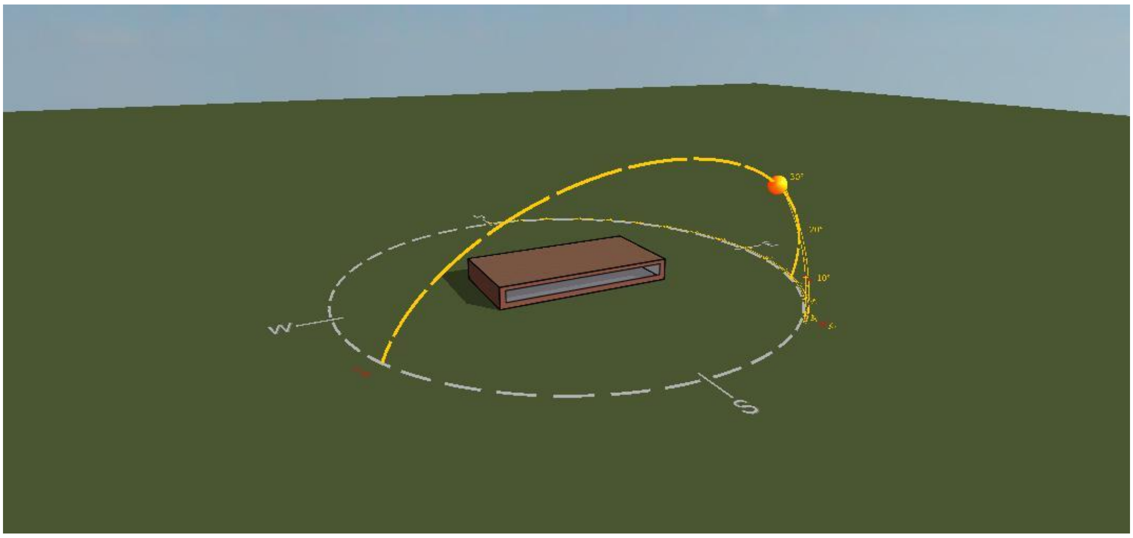


Figure 21: 21 DCE sun path

Summary of the parameters in the research as show in the below table.

Table 8 : Summary of the parameters and variables.

Parameter	Fixed	Variable	Justify
- luminance of the glare source		sunlight	Based on date, time and sky condition
-the position of the observer		Position 1, 2, 3, 4, 5 and 6	Refer figure 19
- iLuminance of the glare source		300 lux-3000 lux	
-Adaptation level	Out of scope		
-Size of the glare source as seen by the observer.	fixed		
- Time of the day.		7, 8, 9, 12, 15	
- Vision correction.	constant		
- reflection	no		
-room configuration.	30 m x15 m		
-glazing transmission.	Glazing Transmittance = 0.7		
-building orientation.		S, E, N	
-date.		21, JUN 21DCE	
-Window size.	Size 1		

-shading	no		Out of scope
Sky conditions		• Clear sky. • intermediate sky with sun. • sunny sky • overcast	

3.7 scenarios and simulation process.

Here to explain more in detail the simulation process and scenarios into the simulation.

As we have the variables are (two-days X four observer positions X four building orientation X one windows shape X three times per day), so the author can do around 144 simulation tests by changing every time one of the variables less or more depends on the results.

The author will start with base case with the material finishing mentioned above and the orientation of the window in the model starts on the East direction.

In this part is to describe the simulation process of the base case scenario.

The first case scenario as per the checklist attached and the parameters table, the variables selected in this scenario are the date which is June 21, the shape of the windows is shape 1 (sh1), the position of the observer is position 1 (P1), the building orientation is East (E) and the time in 9 am (T9). There are three main variables, the author decided to compare between them, in order to get the contrast between them to proceed in the simulation process. The main variables are clear sky, intermediate sky and sunny sky, where in Dubai the climate is hot arid climate so that these different sky conditions are principal.

In the discussion chapter, the author will describe in detail the simulation process, in each condition. In addition, how to add the variables in the IES-VE software, and what are the results comes from the (radiance). The utilized motor for glare investigation will be (Radiance) in which luminance levels will be investigated and demonstrated in hemispherical fish eye pictures.

Since the coating and the glazing is one of the main parts conceded in the simulation process, also it has an obvious impact on glare. Comparing the maximum luminance penetrated from the glazing inward with the threshold at a certain time as well as the condition. After that, the author will look at the output comes from the simulation in each sky condition and compare them with each other.

4. CHAPTER 4: DISCUSSIONS AND FINDING

In this chapter, the simulation and the results the author will discuss it and analyse it in detail. There are two main days as per the parameter table above will be taken in the simulation process Jun21 and DEC21.these two days have been chosen in the simulation process to get the contrast between the day time in the summer and the day time in the winter. In addition, to get how dose day hours effect either long day or short day.

4.1 Simulation in Jun 21 East orientation

This day is the tallest day in the entire year. The author chose this day to start the simulation process in order to understand the impact of the daylight and the glare on the occupants. In term of simulation in the IES-VE, the simulation engine is radiance after adjusting the building configuration and the finishing materials applied in the model from the model it engine, also the orientation can be adjusted in the same stage in the same engine. After that moving to other engine, which is (sun cast), in this part calculation the climate of the selected location (Dubai), the model get into the environment and climate of the selected location and now it is ready to do the simulate the accrual conditions.

Radiance engine can be considered as a main engine in this paper and analysing process where, all most of the Parameters can applied in this stage such as a SDA, ASE, time and date, and to be accurate the ASE will be used in the simulation process as it is responsible to calculate the direct sunlight and the glare calculation . In addition, the photorealistic images can get either isometric picture, hemispheric fish eye or plane. Apart from that, the sky condition is important since it has direct impact and highly effect in the glare and luminance output.

Finally, in the simulated results the display is picture, this picture gives the reading assumed as human eye.

Sun is the highest source of luminance; due to that it causes the glare. The glare threshold calculated in the software 7 times from the luminance level, and the average number used as the threshold, also the user, can write specific number to be considered as a threshold, it could be done manually. The calculations are determined at different angles starts from right +60º to the left -60º and between each angle is 10º for example (60,50,40,30,20,10,0, -10-20…., -60) as show in the figure below.

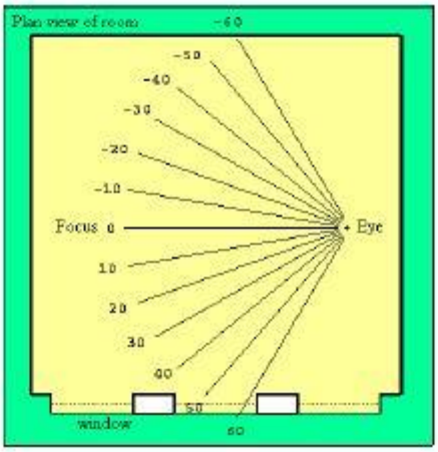


Figure 22: angles of eye view focus

There are three main deferent sky conditions, which are sunny sky, intermediate sky and clear sky.

The author decides to simulate all sky conditions in the same building and the variables will be shape of window all shapes will be simulated one by one, the positions all as it shows in figure 19, building orientation as all direction will tested and the three times 9, 12 and 15.

4.1.1 Sky conditions (clear sky).

In this section, there are three main sky condition concern. Comparing between them is mandatory in order to get the best result as per the Dubai climate and to achieve the occupant comfort. The three sky conditions are clear sky, intermediate sky with sun and sunny sky. The author will include the daylight and glare results and the analysis, when the window of the building is oriented toward the east and at the same time the occupant inside will set oriented 90° to set in all positions as shows in figure 19.

In the simulation, the sky condition will set in the IESVE software as (clear sky) and the position will change in each process 90º. Time will set 7,8,9 am, 12 and 15, in some circumstances depends on the results but the start will be at 9,12,15 and the date will set 21Jun, the orientation of the building will set the window toward east, after that the shape of the window is shape 1 and position is (P1) and the positions will be changed.
The scale for the glare rating system in order to refer the results to the stander scale as show in (table 9). In addition, after finalizing the simulation process one of the previous authors who has investigated in the same topic and subject will take as an example to validate the results, also to have a debate and discuss the pros and cons and compare the results.

Table 9: glare metrics stander scale (Suk et al. 2016)

Degree of Perceived Glare	DGP	DGI	UGR	VCP	CGI
Imperceptible	< 35%	< 18	< 13	80-100	< 13
Perceptible	35% - 40%	18-24	13-22	60-80	13-22
Disturbing	40% - 45%	24-31	22-28	40-60	22-28
Intolerable	> 45%	> 31	> 28	< 40	> 28

1. Daylight and Glare Analysis for Jun 21, (clear sky), (E), (P1) and (T9).

In this part of simulation, the author choses the variables which are, jun21 as a date and window shape as shape1 (sh1). The building orientation depending on the window direction so that he chooses the east orientating (E), after that referring figure 19, the author choses position of the observer as position one (P1), in addition, the time of the simulation is t=9am (T9).

In the IESVE software there are main point has to be set in order to get an accurate result. In simulation tape there is luminance so the author choses (daylight glare probability), the illuminance he chooses (stander image), the sensors he chooses (apache default), in the advance option he chooses (annual sunlight exposure (ASE)) and last option is (full year: 365 days). To the next tape quality is (medium). Moving to (sky/ eye), in the part of sky time / date the choices are clear sky ,21 June, time 9:00. Shifting to the view part, eye view position will sit the axis X and Y as per the position required (figure 19), but Z will be fix as it means the Hight of eye of the occupants, so that the Hight is as a person sitting on the office chair, and as per (neufert architectural standard) the Hight of sitting person is 1.35m so that the eye Hight will be 1.30m and this number will sit in the all positions and simulation process. (International and Edition n.d.). In order to catch the sun in early morning and notice the penetration of the luminance, the author starts the simulation at t=9 am and start to get all result and demonstrate it in a table below.

The simulation starts at this time to have the ability to calculate the glare either direct or reflected one, the author starts the process and the outcome as show in the table 10 below to get into the simulation results.

Table 10: Daylight and Glare Analysis for Jun 21,clear sky, (E), (P1) and (T9).

Glare rating	Maximum luminance = 3194 cd/m² - Threshold = 1274.91 cd/m²							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	24.01%							150%
Perceptible		19.6					21.8	
disturbing			23.36	23.99	41.98	144.3		
intolerable								

The results compared to the stander scale (refer table 9) to know what does the numbers means. Above table demonstrates that at this condition and time the DGP comes imperceptible which means, it is not disturbing the occupant's eye also not causing distraction. The other metrics is important, DGI shows it is Perceptible which means it is fine to the occupant and not reach to the disturbing point. On the other hand, we can see the UGR cross the line to the disturbing zone as per the standard scale as well as the CGI it is 25.02 it is disturbing as per the glare rating. Moving to GVCP and shows disturbing result and this effect the occupant's comfort. There are two more results the author got from the simulation in IESVE from the indices which are GDGR and BRS Glare index, those two reading the author compared them with the other results and came up with the relation so the BRS has a relation with DGI which means the BRS is imperceptible and the GDGR has a relation with CGI so that its disturbing. The threshold at that condition is 1274.91 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 3194cd/m² and these tow numbers is important in the introduced metrics (GTD) to understand the comfort vision environment. in the finding point the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(3194 - 1274.91)}{1274.91} \times 100 = 150\%$$

When implementing the new metric has been introduced by the author the result comes above 100%. The more details will be in the finding after comparing the introduced metric Glare Threshold Differential GTD.

2. . Daylight and Glare Analysis for Jun 21, (clear sky), (E), (P1) and (T12).

In this part of simulation, the author choses the variables which are, jun21 as a date and window shape as shape1 (sh1). The building orientation depending on the window direction so that he chooses the east orientating (E), after that referring figure 19, the author choses position of the observer as position 1 (P1), in addition, the time here will be changed in the simulation to t= 12 (T12).

In simulation tape there is luminance so the author choses (daylight glare probability), the illuminance he chooses (stander image), the sensors he chooses (apache default), in the advance option he chooses (annual sunlight exposure (ASE)) and last option is (full year: 365 days). To the next tape quality is (medium). Moving to (sky/ eye), in the part of sky time / date the choices are sunny sky ,21 June, time 12:00. Shifting to the view part, eye view position will sit the axis X and Y as per the position required (figure 19), but Z will be fix as it means the Hight of eye of the occupants, so that the Hight is as a person sitting on the office chair, and as per (neufert architectural standard) the Hight of sitting person is 1.35m so that the eye Hight will be 1.30m and this number will sit in the all positions and simulation process.(International and Edition n.d.)

In order to catch the sun, the author change the time to 12 to notice the penetration of the luminance, the author starts the simulation and start to get all result and demonstrate it in a table below.

The simulation starts at this time to have the ability to calculate the glare either direct or reflected one, the author starts the process and the outcome as show in the table 11 below to get into the simulation results.

Table 11: Daylight and Glare Analysis for Jun 21, (clear sky), (E), (P1) and (T12).

Glare rating	**Maximum luminance = 3674 cd/m² - Threshold 1468.43 cd/m²**							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	24.41%							150%
perceptible		20.4					22.73	
disturbing			23.36	25.02		160.52		
intolerable					36.57			

The results compared to the stander scale (refer table 9) to know what does the numbers means. Above table demonstrates that at this condition and time the DGP comes imperceptible 24.41% which means, it is not disturbing the occupant's eye also not causing distraction. The other metrics is important, DGI shows it is Perceptible (20.4) which means it is fine to the occupant and not reach to the disturbing point. On the other hand, we can see the UGR cross the line to the disturbing zone (23.36) as per the standard scale as well as the CGI it is (25.02) it is disturbing as per the glare rating. Also, GVCP the reading (36.57) shows intolerable result and this effect the occupant's comfort. There are two more results the author got them from the simulation in IESVE from the indices which are GDGR and BRS Glare index, those tow reading the author compared them with the other results and came up with the relation so the BRS has a relation with DGI which means the BRS is imperceptible and the GDGR has a relation with CGI so that its disturbing. The threshold at that condition is 1468.43 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 3674cd/m² and this two numbers is important in the introduced metrics (GTD) to understand the comfort vision environment. in the finding point the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(3674 - 1468.43)}{1468.43} \times 100 = 150\%$$

When implementing the new metric has been introduced by the author the result comes above 100%. The more details will be in the finding after comparing the introduced metric Glare Threshold Differential GTD.

3. . Daylight and Glare Analysis for Jun 21, (clear sky), (E), (P1) and (T15).

The author choses the variables which are, jun21 as a date and window shape as shape1 (sh1). The building orientation depending on the window direction so that he chooses the east orientating (E), after that referring figure 19, the author choses position of the observer as position 1 (P1), in addition, the time here will be changed in the simulation to t=15 (T15).

In the IESVE software there are main point has to be set in order to get an accurate result. In simulation tape there is luminance so the author choses (daylight glare probability), the illuminance he chooses (stander image), the sensors he chooses (apache default), in the advance option he chooses (annual sunlight exposure (ASE)) and last option is (full year: 365 days). To the next tape quality is (medium). Moving to (sky/ eye), in the part of sky time / date the choices are sunny sky ,21 June, time 15:00. Shifting to the view part, eye view position will sit the axis X and Y as per the position required (figure 19), but Z will be fix as it means the Hight of eye of the occupants, so that the Hight is as a person sitting on the office chair, and as per (neufert architectural standard) the Hight of sitting person is 1.35m so that the eye Hight will be 1.30m and this number will sit in the all positions and simulation process (International and Edition n.d.). In order to catch the sun, the author change the time to 15 to notice the penetration of the luminance, the author starts the simulation and start to get all result and demonstrate it in a table below. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one, the author starts the process and the outcome as show in the table 12 below to get into the simulation results.

Table 12: Daylight and Glare Analysis for Jun 21, (clear sky), (E), (P1) and (T15).

Glare rating	Maximum luminance =1817cd/m² - Threshold 660.36 cd/m²							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	16.54%							
perceptible		18.47	21.64	22.1		114.7	21.55	
disturbing					54.0			
intolerable								175%

The results compared to the stander scale (refer table 9) to know what does the numbers means. Above table demonstrates that at this condition and time the DGP comes imperceptible 16.54% which means, it is not disturbing the occupant's eye also not causing distraction. The other metrics is important, DGI shows it is Perceptible (18.47) which means it is fine to the occupant and not reach to the disturbing point. also, the UGR is perceptible (21.64) as per the standard scale as well as the CGI it is (22.1). On the other hand, GVCP the reading (54.0) shows disturbing result and this effect the occupant's comfort. There are two more results the author got them from the simulation in IESVE from the indices which are GDGR and BRS Glare index, those two reading the author compared them with the other results and came up with the relation so the BRS (21.55) has a relation with DGI which means the BRS is imperceptible and the GDGR (114.7) has a relation with CGI so that its disturbing. The threshold at that condition is 660.36 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 1817cd/m² and this two numbers is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(1817 - 660.36)}{660.36} \times 100 = 175\%$$

When implementing the new metric has been introduced by the author the result comes above 100%. The more details will be in the finding after comparing the introduced metric Glare Threshold Differential GTD.Which means the GTD in the Jun 21, (sh1), (E), (P1) comes 150% in the morning and noontime (T9, T12) and comes 175% in the afternoon time (T15). In the below process the position will changed to position (P2) as shown in the figure below.

4. Daylight and Glare Analysis for Jun 21, (clear sky), (E), (P2) and (T9).

The author choses the variables which are, jun21 as a date and window shape as shape1 (sh1). The building orientation depending on the window direction so that he chooses the east orientating (E), after that referring figure 19, the author changes the position of the observer as position 2 (P2), in addition, the time here will be changed in the simulation to t=9(T9).

In simulation process the same variables and same steps and condition same as what have done in position 1 it will implemented in the position 2. The change will be orienting the observer 90° to reach (p2). In order to catch the sun, the author change the position and the time to notice the penetration of the luminance, the author starts the simulation and start to get all result and demonstrate it in a table below.

The simulation starts at this time to have the ability to calculate the glare either direct or reflected one, the author starts the process and the outcome as show in the table 13 below to get into the simulation results.

Table 13: Daylight and Glare Analysis for Jun 21, (clear sky), (E), (P2) and (T9).

	Maximum luminance =128 cd/m² - Threshold 102.23 cd/m²							
Glare rating	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	N/G	N/G	N/G	N/G	100	N/G	N/G	25%
perceptible								
disturbing								
intolerable								

Due to the position the observer eye is looking to the wall far from the source of the luminance and glare so the IESVE gives result N/A (no glare source) that's why all reding as demonstrated in the table 13 are 0.00, the DGP, DGI, UGR, CGI, GDGR and BRS gives result as imperceptible but GVCP gives reading 100 which also imperceptible , the maximum luminance is 128 cd/m².

The threshold at that condition is 102.23 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 128 cd/m² and this two numbers is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(128 - 102.23)}{102.23} \times 100 = 25\%$$

When implementing the new metric has been introduced by the author the result comes below 100%. The more details will be in the finding after comparing the introduced metric Glare Threshold Differential GTD.

5. Daylight and Glare Analysis for Jun 21, (clear sky), (E), (P2) and (T12).

In this simulation the process and results become same as the previous one (T9). The author choses the variables which are, jun21 as a date and window shape as shape1 (sh1). The building orientation depending on the window direction so that he chooses the east orientating (E), after that referring figure 19, the author changes the position of the observer as position 2 (P2), in addition, the time here will be changed in the simulation to t=12 (T12).

In simulation process the same variables and same steps and condition same as what have done in (P 1) it will implemented in the (P 2). The change will be orienting the observer 90° to reach (p2). In order to catch the sun, the author change the position and the time to notice the penetration of the luminance, the author starts the simulation and start to get all result and demonstrate it in a table below. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one.

The author starts the process and the outcome as show in the table 14 below to get into the simulation results.

Table 14: Daylight and Glare Analysis for Jun 21, (clear sky), (E), (P2) and (T12).

Glare rating	Maximum luminance =166 cd/m² - Threshold 306.87 cd/m²							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	N/G	N/G	N/G	N/G	100	N/G	N/G	-45%
perceptible								
disturbing								
intolerable								

Due to the position the observer eye is looking to the wall far from the source of the luminance and glare so the IESVE gives result (no glare source) that's why all reding as demonstrated in the table 14 are 0.00, the DGP, DGI, UGR, CGI, GDGR and BRS gives result as imperceptible but GVCP gives reading 100 which also imperceptible , the maximum luminance is 166 cd/m².

The threshold at that condition is 306.87 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 166 cd/m² and this two numbers is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(166 - 306.87)}{306.87} \times 100 = -45\ \%$$

When implementing the new metric has been introduced by the author the result comes extremely below 100%. The more details will be in the finding after comparing the introduced metric Glare Threshold Differential GTD.

6. Daylight and Glare Analysis for Jun 21, (clear sky), (E), (P2) and (T15).

In this simulation the process and results become same as the previous one (T12). The author choses the variables which are, jun21 as a date and window shape as shape1 (sh1). The building orientation depending on the window direction so that he chooses the East orientating (E), after that referring figure 19, the author changes the position of the observer as position 2 (P2), in addition, the time here will be changed in the simulation to t=15 (T15).

In simulation process the same variables and same steps and condition same as what have done in position 1 it will implemented in the position 2. The change will be orienting the observer 90° to reach (p2). In order to catch the sun, the author change the position and the time to notice the penetration of the luminance, the author starts the simulation and start to get all result and demonstrate it in a table below.

The simulation starts at this time to have the ability to calculate the glare either direct or reflected one, the author starts the process and the outcome as show in the table 15 below to get into the simulation results.

Table 15: Daylight and Glare Analysis for Jun 21, (clear sky), (E), (P2) and (T15).

Glare rating	**Maximum luminance = 76 cd/m² - Threshold 158.01 cd/m²**							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	N/G	N/G	N/G	N/G	100	N/G	N/G	-51%
perceptible								
disturbing								
intolerable								

Due to the position the observer eye is looking to the wall far from the source of the luminance and glare so the IESVE gives result (no glare source) that's why all reding as demonstrated in the table 15 are 0.00, the DGP, DGI, UGR, CGI, GDGR and BRS gives result as imperceptible but GVCP gives reading 100 which also imperceptible, the maximum luminance is 76 cd/m².

The threshold at that condition is 158.01 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 76 cd/m² and this two numbers is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(76 - 158.01)}{158.01} \times 100 = -51\%$$

When implementing the new metric has been introduced by the author the result comes 100%. The more details will be in the finding after comparing the introduced metric Glare Threshold Differential GTD. Which means the GTD in the Jun 21, (sh1), (E), (P2) comes 100% in the morning, noon and after noon time (T9, T12, T15). Because of these results in (P2) the author decided to neglect this position in the next simulation process in the upcoming simulations, after changing the variables which are, the sky condition, date, building orientation and the time.

Another position is prepared to get simulated and gather the results from the software. In the below process the position will changed to position (P3) as shown in the figure 19.

7. Daylight and Glare Analysis for Jun 21, (clear sky), (E), (P3) and (T9).

In this simulation the process and results become same as the previous ones. The author choses the variables which are, jun21 as a date and window shape as shape1 (sh1). The building orientation depending on the window direction so that he chooses the East orientating (E), after that referring figure 19, the author changes the position of the observer as position 3 (P3), in addition, the time here will be changed in the simulation to t = 9 (T9), and the results will compare to P1 to see the difference where both have same location but different view position. This all comes in the approach of figuring out the glare and understanding the luminance and sunlight behaviour and its impact on the employers in the office time as it is in the most of the offices in Dubai starts from 8 to 15. In simulation process the same variables and same steps and condition same as what have done in (P1) it will implemented in the (P 3), the change will be orienting the observer 90° to reach (p3).

In order to catch the sun, the author change the position and the time to notice the penetration of the luminance, the author starts the simulation and start to get all result and demonstrate it in a table below.

The simulation starts at this time to have the ability to calculate the glare either direct or reflected one, the author starts the process and the outcome as show in the table 16 below to get into the simulation results.

Table 16: Daylight and Glare Analysis for Jun 21, (clear sky), (E), (P3) and (T9).

Glare rating	**Maximum luminance =2865cd/m² - Threshold 1045.15 cd/m²**							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	20.69%							174%
perceptible		18.31	21.08				20.16	
disturbing				23.22	46.28	132.89		
intolerable								

The results compared to the stander scale (refer table 9) to know what does the numbers means. Above table demonstrates that at this condition and time the DGP comes imperceptible 20.69% which means, it is not disturbing the occupant's eye also not causing distraction. The other metrics is important, DGI shows it is Perceptible (18.31) which means it is fine to the occupant and not reach to the disturbing point. also, the UGR is perceptible (21.08) as per the standard scale. When check the result of CGI, it is (23.22) which means it is disturbing as per the scale. also, GVCP the reading (46.28) shows disturbing result and this effect the occupant's comfort. There are two more results the author got them from the simulation in IESVE from the indices which are GDGR and BRS Glare index, those two reading the author compared them with the other results and came up with the relation so the BRS (20.16) has a relation with DGI which means the BRS is imperceptible and the GDGR (132.89) has a relation with CGI so that its disturbing. The threshold at that condition is 1045.15 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 2865cd/m² and this two numbers is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(2865 - 1045.15)}{1045.15} \times 100 = 174\%$$

When implementing the new metric has been introduced by the author the result comes above 100%. The more details will be in the finding after comparing the introduced metric Glare Threshold Differential GTD.

8. Daylight and Glare Analysis for Jun 21, (clear sky), (E), (P3) and (T12).

In the approach the understand the glare and analyse it. The author choses the variables which are, jun21 as a date and window shape as shape1 (sh1). The building orientation depending on the window direction so that he chooses the East orientating (E), after that referring figure19, the author changes the position of the observer as position 3 (P3), in addition, the time here will be changed in the simulation to t = 12 (T12), and the results will compare to P1 to see the difference where both have same location but different view position. This all comes in the approach of figuring out the glare and understanding the luminance and sunlight behaviour and its impact on the employers in the office time as it is in the most of the offices in Dubai starts from 8 to 15.

In simulation process the same variables and same steps and condition same as what have done in (p 1) it will implemented in the (p 3), the change in this part is only the time. In order to catch the sun, the author change the position and the time to notice the penetration of the luminance, the author starts the simulation and start to get all result and demonstrate it in a table below. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one, the author starts the process and the outcome as show in the table 17 below to get into the simulation results.

Table 17: Daylight and Glare Analysis for Jun 21, (clear sky), (E), (P3) and (T12).

Glare rating	Maximum luminance =3687cd/m² - Threshold 1269.7 cd/m²							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	22.12%							190%
perceptible		19.63					21.76	
disturbing			22.77	24.85		158.23		
intolerable					37.29			

The results compared to the stander scale (refer table 9) to know what does the numbers means. Above table demonstrates that at this condition and time the DGP comes imperceptible 22.12% which means, it is not disturbing the occupant's eye also not causing distraction. The other metrics is important, DGI shows it is Perceptible (19.63) which means it is fine to the occupant and not reached to the disturbing point. On the other hand, the UGR is disturbing (22.77) as per the standard scale. When check the result of CGI, it is (24.85) which means it is disturbing as per the scale. also, GVCP the reading (46.28) shows disturbing result and this effect the occupant's comfort. There are two more results the author got them from the simulation in IESVE from the indices which are GDGR and BRS Glare index, those two reading the author compared them with the other results and came up with the relation so the BRS (20.16) has a relation with DGI which means the BRS is imperceptible and the GDGR (132.89) has a relation with CGI so that its disturbing. The threshold at that condition is 1269.7 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 3687cd/m² and this two numbers is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(3687 - 1269.7)}{1269.7} \times 100 = 190\%$$

When implementing the new metric has been introduced by the author the result comes above 100%. The more details will be in the finding after comparing the introduced metric Glare Threshold Differential GTD.

9. Daylight and Glare Analysis for Jun 21, (clear sky), (E), (P3) and (T15).

In the approach the understand the glare and analyse it. The author choses the variables which are, jun21 as a date and window shape as shape1 (sh1). The building orientation is depending on the window direction, so that author chooses the East orientating (E), (referring figure 19). After that, the author changes the position of the observer to position 3 (P3), in addition, the time here will be changed in the simulation to t = 15 (T15), and the results will compare to P1 to see the difference where both have same location but different view position. This all comes in the approach of figuring out the glare and understanding the luminance and sunlight behaviour and its impact on the employers in the office time as it is in the most of the offices in Dubai starts from 8 to 15.

In simulation process the same variables and same steps and condition same as what have done in (p 1) it will implemented in the (p 3), the change in this part is only the time. In order to catch the sun, the author change the position and the time to notice the penetration of the luminance, the author starts the simulation and start to get all result and demonstrate it in a table below. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one, the author starts the process and the outcome as show in the table 18 below to get into the simulation results.

Table 18: Daylight and Glare Analysis for Jun 21, (clear sky), (E), (P3) and (T15).

	Maximum luminance =1866cd/m² - Threshold 600.46 cd/m²							
Glare rating	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	12.59%							210%
perceptible		18.56	21.35			117.67	21.13	
disturbing				22.46	52.69			
intolerable								

The results compared to the stander scale (refer table 9) to know what does the numbers means. Above table demonstrates that at this condition and time the DGP comes imperceptible 12.59% which means, it is not disturbing the occupant's eye at all, also not causing distraction. The other metrics is important, DGI shows it is Perceptible (18.56) which means it is fine to the occupant and not reached to the disturbing point. Also, the UGR is perceptible (21.35) as per the standard scale. When check the result of CGI, it is (22.46) which means it is disturbing as per the scale. also, GVCP the reading (52.69) shows disturbing result and this effect the occupant's comfort. There are two more results the author got them from the simulation in IESVE from the indices which are GDGR and BRS Glare index, those two reading the author compared them with the other results and came up with the relation so the BRS (21.13) has a relation with DGI which means the BRS is imperceptible and the GDGR (117.67) has a relation with CGI so that its disturbing. The threshold at that condition is 600.46 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 1866cd/m² and this two numbers is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(1866 - 600.46)}{600.46} \times 100 = 210\%$$

When implementing the new metric has been introduced by the author the result comes above 100%. The more details will be in the finding after comparing the introduced metric Glare Threshold Differential GTD. Which means the GTD in the Jun 21, (sh1), (E), (P3) comes 174% in the morning(T9), 190 % at noon time (12) and after noon time (15) become 210%.

The results demonstrate a difference between the P3 and P1 in term of the results from the IESVE as well as the results of GTD, in the finding further details will explain and discuss. Another position is prepared to get simulated and gather the results from the software. In the below process the position will changed to position (P4) as shown in the figure below.

10. Daylight and Glare Analysis for Jun 21, (clear sky), (E), (P4) and (T9).

In the approach of understanding the glare and analyse it. The author choses the variables which are, jun21 as a date and window shape as shape1 (sh1). The building orientation is depending on the window direction, so that author chooses the East orientating (E), (referring figure 19). After that, the author changes the position of the observer to position 4 (P4), in addition, the time here will be changed in the simulation starts at 9,12 and 15 , so the start will be at t=9 and the results will compare to P1,p2 and P3 to see the different results in the different view positions. This all comes in the approach of figuring out the glare and understanding the luminance and sunlight behaviour and its impact on the employers in the office time as it is in the most of the offices in Dubai starts from 8 to 15.

In simulation process the same variables and same steps and condition same as what have done in (p 1) it will implemented in the (p 4), the change in this part is only the position view. In order to catch the sun, the author change the position and the time to notice the penetration of the luminance, the author starts the simulation and start to get all result and demonstrate it in a table below. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one, the author starts the process and the outcome as show in the table 19 below to get into the simulation results.

Table 19: Daylight and Glare Analysis for Jun 21, (clear sky), (E), (P4) and (T9).

Glare rating	Maximum luminance = 2934 cd/m² - Threshold 1390.51 cd/m²							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	26.50%							111%
perceptible		23.27					26.17	
disturbing								
intolerable			28.62	30.98	1.14	692.1		

The results compared to the stander scale (refer table 9) to know what does the number mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 26.50%, which means, the glare is not disturbing the occupant's eye at all, also not causing distraction. The other metrics is important, DGI shows it is Perceptible (23.27), which means it is fine to the occupant and not reached to the disturbing point. In addition, the UGR is intolerable (28.62) as per the standard scale. When check the result of CGI it is (30.98), which means it is disturbing as per the scale. Also, GVCP the reading (1.14) shows intolerable result and this effect the occupant's comfort. There are two more results; the author got them from the simulation in IESVE from the indices, which are GDGR and BRS Glare index. Those two reading the author compared them with the other results and came up with the relation, so the BRS (26.17) has a relation with DGI, which means the BRS is perceptible, and the GDGR (692.1) has a relation with CGI so that it is intolerable which has

an impact on the zone's users. The threshold at that condition is 1390.51 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 2934 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(2934 - 1390.51)}{1390.51} \times 100 = 111\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes above 100%. The more details will be in the finding after comparing the introduced metric Glare Threshold Differential GTD. Which means the GTD in the Jun 21, (sh1), (E), (P4) comes 111%.

11. Daylight and Glare Analysis for Jun 21, (clear sky), (E), (P4) and (T12).

In the approach of understanding the glare and analyse it. The author choses the variables which are, jun21 as a date and window shape as shape1 (sh1). The building orientation is depending on the window direction, so that author chooses the East orientating (E), (referring figure 19). After that, the author changes the position of the observer to position 4 (P4), in addition, the time here will be changed in the simulation 9,12 and 15 , so the after finishing t=9, the second step at t=12 and the results will compare to P1,p2 and P3 to see the different results in the different view positions. This all comes in the approach of figuring out the glare and understanding the luminance and sunlight behaviour and its impact on the employers in the office time as it is in the most of the offices in Dubai starts from 8 to 15.

In simulation process the same variables and same steps and condition same as what have done in (p 1) it will implemented in the (p 4), the change in this part is only the position view. In order to catch the sun, the author change the position and the time to notice the penetration of the luminance, the author starts the simulation and start to get all result and demonstrate it in a table below. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one, the author starts the process and the outcome as show in the table 20 below to get into the simulation results.

Table 20: Daylight and Glare Analysis for Jun 21, (clear sky), (E), (P4) and (T12).

Glare rating	**Maximum luminance = 3689 cd/m² - Threshold 1674.93 cd/m²**							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	28.07%							120%
perceptible		24.15					27.32	
disturbing								
intolerable			29.87	32.44	0.65	810.91		

The results compared to the stander scale (refer table 9) to know what does the number mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 28.07%, which means, the glare is not disturbing the occupant's eye at all, also not causing any distraction. The other metrics is important, DGI shows it is Perceptible (24.15), which means it is fine to the zone's users and not reached to the disturbing point. In addition, the UGR is intolerable (29.87) as per the standard scale. When check the result of CGI it is (32.44), which means it is disturbing as per the scale. Also, GVCP the reading (0.65) shows intolerable result and this effect the occupant's comfort. There are two more results; the author got them from the simulation in IESVE from the indices, which are GDGR and BRS Glare index. Those two reading the author compared them with the other results and came up with the relation, so the BRS (27.32) has a relation with DGI, which means the BRS is perceptible, and the GDGR (810.91) has a relation with CGI so that it is intolerable which has an impact on the zone's users. The threshold at that condition is 1674.93 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 3689 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(3689 - 1674.93)}{1674.93} \times 100 = 120\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes above 100%. The more details will be in the finding after comparing the introduced metric Glare Threshold Differential GTD. Which means the GTD in the Jun 21, (sh1), (E), (P4) comes 120%.

12. Daylight and Glare Analysis for Jun 21, (clear sky), (E), (P4) and (T15).

In the approach of understanding the glare and analyse it. The author choses the variables which are, jun21 as a date and window shape as shape1 (sh1). The building orientation is depending on the window direction, so that author chooses the East orientating (E), (referring figure 19). After that, the author changes the position of the observer to position 4 (P4), in addition, the time here will be changed in the simulation 9,12 and 15 , so the after finishing t=9, the second step at t=15 and the results will compare to P1,p2 and P3 to see the different results in the different view positions. This all comes in the approach of figuring out the glare and understanding the luminance and sunlight behaviour and its impact on the employers in the office time as it is in the most of the offices in Dubai starts from 8 to 15.

In simulation process the same variables and same steps and condition same as what have done in (p 1) it will implemented in the (p 4), the change in this part is only the position view. In order to catch the sun, the author change the position and the time to notice the penetration of the luminance, the author starts the simulation and start to get all result and demonstrate it in a table below. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one, the author starts the process and the outcome as show in the table 21 below to get into the simulation results.

Table 21: Daylight and Glare Analysis for Jun 21, (clear sky), (E), (P4) and (T15).

Glare rating	Maximum luminance =1831cd/m²Threshold 771.10 cd/m²							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	24.58%							201%
perceptible		22.79					26.53	
disturbing				28.86		568.35		
intolerable			28.26		2.19			

The results compared to the stander scale (refer table 9) to know what does the number mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 24.58%, it is reduced and less than what occur in t=12, the glare is not disturbing the occupant’s eye at all, also not causing any distraction. The other metrics is important, DGI shows it is Perceptible (22.79), which means it is fine to the zone’s users and not reached to the disturbing point. In addition, the UGR is intolerable (28.26) as per the standard scale. When check the result of CGI it is (28.86), which means it is disturbing as per the scale. Also, GVCP the reading (2.19) shows intolerable result and this effect the occupant's comfort. There are two more results; the author got them from the simulation in IESVE from the indices, which are GDGR and BRS Glare index. Those two reading the author compared them with the other results and came up with the relation, so the BRS (26.53) has a relation with DGI, which means the BRS is perceptible, and the GDGR (568.35) has a relation with CGI so that it is intolerable which has an impact on the zone's users. The threshold at that condition is 771.1 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 1831 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(1831 - 771.10)}{771.10} \times 100 = 201\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes above 100%. The more details will be in the finding after comparing the introduced metric Glare Threshold Differential GTD. Which means the GTD in the Jun 21, (sh1), (E), (P4) comes 111% in the morning (T9), 120 % at noon time (T12) and after noon time (T15) become 201%.

After doing the simulation process for the clear sky in all position, the author notes that most of the impact and the penetration of the daylight comes in the position (P4) besides the glare impact on the individuals and the occupants inside the office room is obvious in these positions. Consequently, the author decided to neglect the simulation in (P2) as it is not giving results in term of glare. Moreover, complete simulation process in the (P4), in order to make a comparison between all sky conditions and come up with best results to proceed in the rest of the process.

4.1.2 Sky conditions (Intermediate sky with sun).

After the results from the previous sky condition, the author will change the simulation process's sky condition to get more glare and light in term of determine the discomfort glare time and conditions.

In the simulation, the sky condition will set in the IESVE software as (intermediate sky with sun) and the position will change in each process 90º. Time will set 9 am, 12 and 15, and the date will set 21 Jun, the orientation of the building will set the window toward East, after that the shape of the window is shape 1 and position is (P4).The scale for the glare rating system in order to refer the results to the stander scale.

1. Daylight and Glare Analysis for Jun 21, (intermediate sky with sun), (E), (P4) and (T9).

The author choses the variables which are, jun21 as a date and window shape as shape1 (sh1). The building orientation depending on the window direction so that he chooses the East orientating (E), after that referring figure 19, the author choses position of the observer as position 4 (P4), in addition, the time here will be changed in the simulation to t=9 (T9).

In the IESVE software there are main point has to be set in order to get an accurate result. As what mentioned in term of software steps.

In simulation tape there is luminance so the author choses (daylight glare probability), the illuminance he chooses (stander image), the sensors he chooses (apache default), in the advance option, he chooses (annual sunlight exposure (ASE)) and last option is (full year: 365 days). To the next tape, quality is (medium). Moving to (sky/ eye), in the part of sky time / date, the choices are sunny sky, 21 June and time 9:00. Shifting to the view part, eye view position will sit the axis X and Y as per the position required (figure 19), but Z will be fix as it means the Height of eye of the observer. So that the height is as a person sitting on the office chair and as per (neufert architectural standard) the height of sitting person is 1.35m so that the eye height will be 1.30m and this number will sit in the all positions and simulation process.   (International and Edition n.d.). In order to catch the sun, the author change the time to t = 9 to notice the penetration of the luminance, the author starts the simulation and start to get all result and demonstrate it in a table below.

The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as show in the table 22 below to get into the simulation results.

Table 22: Daylight and Glare Analysis for Jun 21, (intermediate sky with sun), (E), (P4) and (T9).

Glare rating	Maximum luminance = 2953 cd/m² - Threshold 2238.39 cd/m²							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	29.31%							31%
perceptible		20.36					21.21	
disturbing			25.03					
intolerable				29.39	2.56	540.91		

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 29.31%, the glare is not disturbing the occupant's eye at all, also not causing any distraction. The other metrics is important, DGI shows it is Perceptible (20.36), which means it is fine to the zone's users and not reached to the disturbing point. In addition, the UGR is disturbing (25.03) as per the standard scale. When check the result of CGI it is (29.39), which means it is disturbing as per the scale. Also, GVCP the reading (2.56) shows intolerable result and this effect the occupant's comfort. There are two more results; the author got them from the simulation in IESVE from the indices, which are GDGR and BRS Glare index. Those two reading the author compared them with the other results and came up with the relation, so the BRS (21.21) has a relation with DGI, which means the BRS is perceptible, and the GDGR (540.91) has a relation with CGI so that it is disturbing which has an impact on the zone's users. The threshold at that condition is 2238.39.1 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 2953 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(2953 - 2238.39)}{2238.39} \times 100 = 31\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes below 100%. The results become extremely different from same conditions in the clear sky simulation. The more details will be in the finding after comparing the introduced metric Glare Threshold Differential GTD.

2. . Daylight and Glare Analysis for Jun 21, (intermediate sky with sun), (E), (P4) and (T12).

In the approach of understanding the glare and analyse it. The author choses the variables which are, jun21 as a date and window shape as shape1 (sh1). The building orientation is depending on the window direction, so that author chooses the East orientating (E), (referring figure 19). After that, the author keeps the position (P4) and change the time to t=12. This all comes in the approach of figuring out the glare and understanding the luminance and sunlight behaviour and its impact on the employers in the office time as it is in the most of the offices in Dubai starts from 8 to 15. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. the author starts the process and the outcome as show in the table 23 below to get into the simulation results.

Table 23: Daylight and Glare Analysis for Jun 21, (intermediate sky with sun, (E), (P4) and (T12).

	Maximum luminance =530 cd/m² - Threshold 343.66 cd/m²							
Glare rating	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	19.91%							54%
perceptible		19.57					22.24	
disturbing			23.47	23.63		345.49		
intolerable					8.74			

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 19.91%, the glare is not disturbing the occupant's eye at all, also not causing any distraction. The other metrics is important, DGI shows it is Perceptible (19.57), which means it is fine to the zone's users and not yet reached to the disturbing point. In addition, the UGR is disturbing (23.47) as per the standard scale. When check the result of CGI it is (23.36), which means it is disturbing as per the scale. GVCP the reading (8.74) shows intolerable result and this effect the occupant's comfort. The BRS (22.24) has a relation with DGI, which means the BRS is perceptible, and the GDGR (345.49) has a relation with CGI so that it is disturbing which has an impact on the zone's users. The threshold at that condition is 343.66 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 530 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(530 - 343.66)}{343.66} \times 100 = 54\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes below 100%. The results become extremely different from same conditions in the clear sky simulation. The more details will be in the finding after comparing the introduced metric Glare Threshold Differential GTD.

3. . Daylight and Glare Analysis for Jun 21, (intermediate sky with sun), (E), (P4) and (T15).

In the approach of understanding the glare and analyse it. The author choses the variables which are, jun21 as a date and window shape as shape1 (sh1). The building orientation is depending on the window direction, so that author chooses the East orientating (E), (referring figure 19). After that, the author keeps the position (P4) and change the time to t=15. This all comes in the approach of figuring out the glare and understanding the luminance and sunlight behaviour and its impact on the employers in the office time as it is in the most of the offices in Dubai starts from 8 to 15. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as show in the table 24 below to get into the simulation results.

Table 24: Daylight and Glare Analysis for Jun 21, (intermediate sky with sun), (E), (P4) and (T15).

Glare rating	Maximum luminance = 778 cd/m² - Threshold 480.41 cd/m²							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	22.91%							61%
perceptible		20.78					23.78	
disturbing			25.20	25.42		429.62		
intolerable					4.99			

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 22.91%, the glare is not disturbing the occupant's eye at all, also not causing any distraction. The other metrics is important, DGI shows it is Perceptible (20.78), which means it is fine to the zone's users and not reached to the disturbing point. In addition, the UGR is disturbing

(25.20) as per the standard scale. When check the result of CGI it is (25.42), which means it is disturbing as per the scale. GVCP the reading (4.99) shows intolerable result and this effect the occupant's comfort. The BRS (23.78) has a relation with DGI, which means the BRS is perceptible, and the GDGR (429.62) has a relation with CGI so that it is disturbing which has an impact on the zone's users. The threshold at that condition is 480.41 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 778 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(778 - 480.41)}{480.41} \times 100 = 61\%$$

After changing the sky condition to Intermediate sky with sun the results become slightly different which means the GTD in the Jun 21, (sh1), (E), (P4) is different than the same time and in the clear sky condition. The reading become 31% in the morning (T9), 54 % at noon time (t12) and after noon time (t15) become 61%.

4.1.3 Sky condition (Sunny sky)

In the simulation, the sky condition will set in the IESVE software as sunny sky, and the position will change in each process 90º. Time will set 9 am, 12 and 15, and the date will set 21 Jun, the orientation of the building will set the window toward East, after that the shape of the window is shape 1 and position is (P4).

The scale for the glare rating system in order to refer the results to the stander scale.

1- Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P4) and (T9).

In the approach of understanding the glare and analyse it. The author choses the variables which are, jun21 as a date and window shape as shape1 (sh1). The building orientation is depending on the window direction, so that author chooses the East orientating (E), (referring figure 19). After that, the author keeps the position (P4) and the time is t=9. This all comes in the approach of figuring out the glare and understanding the luminance and sunlight behaviour and its impact on the employers in the office time as it is in the most of the offices in Dubai starts from 8 to 15. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as show in the table 25 below to get into the simulation results.

Table 25: Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P4) and (T9).

Glare rating	Maximum luminance =7359 cd/m² - Threshold 5465.58 cd/m²							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible								34%
perceptible	39.97%	18.51					19.52	
disturbing			23.84					
intolerable				29.9	4.66	440.47		

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 39.97%, the glare is not disturbing the occupant's eye at all, also not causing any distraction. The other metrics is important, DGI shows it is Perceptible (18.51), which means it is fine to the zone's users and not reached to the disturbing point. In addition, the UGR is disturbing (23.84) as per the standard scale. When check the result of CGI it is (29.9), which means it is intolerable as per the scale. GVCP the reading (4.66) shows intolerable result and this effect the occupant's comfort. The BRS (19.52) has a relation with DGI, which means the BRS is perceptible, and the GDGR (440.4) has a relation with CGI so that it is disturbing which has an impact on the zone's users. The threshold at that condition is 5465.58 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 7359 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(7359 - 5465.58)}{5465.58} \times 100 = 34\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes below 100%.

2- . Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P4) and (T12).

In the approach of understanding the glare and analyse it. The author choses the variables which are, jun21 as a date and window shape as shape1 (sh1). The building orientation is depending on the window direction, so that author chooses the East orientating (E), (referring figure 19). After that, the author keeps the position (P4) and the time is t=12. This all comes in the approach of figuring out the glare and understanding the luminance and sunlight behaviour and its impact on the employers in the office time as it is in the most of the offices in Dubai starts from 8 to 15. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as show in the table 26 below to get into the simulation results.

Table 26: Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P4) and (T12).

Glare rating	**Maximum luminance = 3695 cd/m² - Threshold 2090.75 cd/m²**							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	31.08%							76%
perceptible								
disturbing		25.43					29.11	
intolerable			31.63	34.05	0.22	1071		

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 31.08%, the glare is not disturbing the occupant's eye at all, also not causing any distraction. The other metrics is important, DGI shows it is disturbing (25.43). In addition, the UGR is intolerable (31.63) as per the standard scale. When check the result of CGI it is (34.05), which means it is intolerable as per the scale. GVCP the reading (0.22) shows intolerable result and this effect the occupant's comfort. The BRS (29.11) has a relation with DGI, which means the BRS is disturbing, and the GDGR (1071) has a relation with CGI so that it is intolerable which has an impact on the zone's users. The threshold at that condition is 2090.75 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 3695 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(3695 - 2090.75)}{2090.75} \times 100 = 76\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes below 100%.

3- Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P4) and (T15).

In the approach of understanding the glare and analyse it. The author choses the variables which are, jun21 as a date and window shape as shape1 (sh1). The building orientation is depending on the window direction, so that author chooses the East orientating (E), (referring figure 19). After that, the author keeps the position (P4) and the time is t=15. This all comes in the approach of figuring out the glare and understanding the luminance and sunlight behaviour and its impact on the employers in the office time as it is in the most of the offices in Dubai starts from 8 to 15. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as show in the table 27 below to get into the simulation results.

Table 27: Daylight and Glare Analysis for, Jun 21, (sunny sky), (E), (P4) and (T15).

	Maximum luminance = 1745 cd/m² - Threshold 929.57 cd/m²							
Glare rating	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	26.32%							87%
perceptible								
disturbing		24.14					28.66	
intolerable			30.26	30.11	0.88	746.35		

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 26.32%, the glare is not disturbing the occupant's eye at all, also not causing any distraction. The other metrics is important, DGI shows it is disturbing (24.14). In addition, the UGR is intolerable (30.26) as per the standard scale. When check the result of CGI it is (30.11), which means it is intolerable as per the scale. GVCP the reading (0.88) shows intolerable result and this effect the occupant's comfort. the BRS (28.66) has a relation with DGI, which means the BRS is disturbing, and the GDGR (746.35) has a relation with CGI so that it is intolerable which has an impact on the zone's users. The threshold at that condition is 929.57cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 1745 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(1745 - 929.57)}{929.57} \times 100 = 87\%$$

After changing the sky condition to sunny sky with sun the results become slightly different Which means the GTD in the Jun 21, (sh1), (E), (P4) is different than the same time and in the clear sky condition. the reading become 34% in the morning(T9), 76 % at noon time (t12) and after noon time (t15) become 87%. The results are not yet satisfying, so that the author will add more positions and try to add more times in order to have a variety in the results to compare it.

4- Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P4) and (T7).

In the approach of understanding the glare and analyse it. The author added t=7 to simulation in the same position and condition same as t=9, t=12 and t=15. Moving to the results below in table 28.

Table 28: Daylight and Glare Analysis for, Jun 21, (sunny sky), (E), (P4) and (T7).

Glare rating	Maximum luminance =8324cd/m² - Threshold 9530.86 cd/m²							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	N/G	N/G	N/G	N/G	100	N/G	N/G	-12%
perceptible								
disturbing								
intolerable								

Due to the time the observer eye didn't get the glare source as per IESVE gives result (no glare source) that's why all reding as demonstrated in the table 28 are 0.00, the DGP, DGI, UGR, CGI, GDGR and BRS gives result as imperceptible but GVCP gives 100 and also imperceptible, but in term of luminance the maximum luminance is 8324 cd/m².

The threshold at that condition is 9530 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 8324 cd/m² and this two numbers is important in the introduced metrics (GTD) to understand the comfort vision environment. in the finding point the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(8324 - 9530.86)}{9530.86} \times 100 = -12\%$$

Here is an extremely different than before the result of the GTD is - 12%. this proves that there no glare at this time.

Also, the author trying to do the same simulation at T8 and the result in table below (table 29)

5- Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P4) and (T8).

In the approach of understanding the glare and analyse it. The author added t=8 to simulation in the same position and condition same as t=9, t=12 and t=15. Moving to the results below in table 29.

Table 29: Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P4) and (T8).

Glare rating	**Maximum luminance = 6279 cd/m² - Threshold 7493.63 cd/m²**							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	N/G	N/G	N/G	N/G	100	N/G	N/G	-16%
perceptible								
disturbing								
intolerable								

Due to the time the observer eye didn't get the glare source as per IESVE gives result (no glare source) that's why all reding as demonstrated in the table 29 are 0.00, the DGP, DGI, UGR, CGI, GDGR and BRS gives result as imperceptible but GVCP gives reading 100 and also imperceptible, but in term of luminance the maximum luminance is 6279 cd/m².

The threshold at that condition is 7493.63 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 6279 cd/m² and this two numbers is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(6279 - 7493.63)}{7493.63} \times 100 = -16\%$$

Here is an extremely different than before the result of the GTD is - 16%. this proves that there no glare at this time.

After this result, it still not satisfying so that the author will add more position and keep the time as before T9, T12and T15.

The positions will be as a (figure 19) P5 and P6, and the author will start with P5.

6- Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P5) and (T7).

In the approach of understanding the glare and analyse it. The author choses the variables which are, jun21 as a date and window shape as shape1 (sh1). The building orientation is depending on the window direction, so that author chooses the East orientating (E), (referring figure 19). After that, the author changes the position to (P5) and the time is t=7. This all comes in the approach of figuring out the glare and understanding the luminance and sunlight behaviour and its impact on the employers in the office time as it is in the most of the offices in Dubai starts from 8 to 15. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one, the author starts the process and the outcome as show in the table 30 below to get into the simulation results.

Table 30: Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P5) and (T7).

Glare rating	Maximum luminance = 4779 cd/m² - Threshold 3600.40 cd/m²							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	30.65%	0.00	2.14	5.46	99.75	14.76	0.00	32.7%
perceptible								
disturbing								
intolerable								

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 30.65%, DGI (0.00). In addition, the UGR is (2.14), CGI it is (5.46), GVCP reading (99.75). the BRS (0.00) has a relation with DGI, which means the BRS is disturbing, and the GDGR (14.76) has a relation with CGI so that it is intolerable which has an impact on the zone's users. The threshold at that condition is 3600.40 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 4779 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(4779 - 3600.40)}{3600.40} \times 100 = 32.7\%$$

Here is the result of P5 comes near to the results of P4, GTD is 32%.

7- Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P5) and (T9).

In the approach of understanding the glare and analyse it. The author choses the variables which are, jun21 as a date and window shape as shape1 (sh1). The building orientation is depending on the window direction, so that author chooses the East orientating (E), (referring figure 19). After that, the author changes the position to (P5) and the time is t=9. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one, the author starts the process and the outcome as show in the table 31 below to get into the simulation results.

Table 31: Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P5) and (T9).

Glare rating	**Maximum luminance = 3249 cd/m² - Threshold 2727.55 cd/m²**							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	27%	18.57					19.37	19%
perceptible			21.63					
disturbing				25.91	44.42	137.69		
intolerable								

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 27%, DGI (18.57). In addition, the UGR is (21.63), CGI it is (25.91), GVCP reading (44.42). the BRS (0.00) has a relation with DGI, which means the BRS is imperceptible, and the GDGR (14.76) has a relation with CGI so that it is disturbing which has an impact on the zone's users. The threshold at that condition is 2727.55.40 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 3249 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(3249 - 2727.55)}{2727.55} \times 100 = 19\%$$

Here is the result of P5 comes near to the results of P4, GTD is 32%.

8- Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P5) and (T12).

In the approach of understanding the glare and analyse it. The author choses the variables which are, jun21 as a date and window shape as shape1 (sh1). The building orientation is depending on the window direction, so that author chooses the East orientating (E), (referring figure 19). After that, the author changes the position to (P5) and the time is t=12. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one, the author starts the process and the outcome as show in the table 32 below to get into the simulation results.

Table 32: Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P5) and (T12).

Glare rating	Maximum luminance = 3647 cd/m² - Threshold 987.61 cd/m²							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	23.18%							269%
perceptible		21.49					23.52	
disturbing			24.41	26.27		205.37		
intolerable					25.17			

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 23.18%, DGI (21.49). In addition, the UGR is (24.41), CGI it is (26.27), GVCP reading (25.17). the BRS (23.52) has a relation with DGI, which means the BRS is perceptible, and the GDGR (205.37) has a relation with CGI so that it is disturbing which has an impact on the zone's users. The threshold at that condition is 987.61 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 3647 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(3647 - 987.61\ )}{987.61} \times 100 = 269\%$$

Here is the result of P5 comes near to the results of P4, GTD is 269%.

9- Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P5) and (T15).

In the approach of understanding the glare and analyse it. The author choses the variables which are, jun21 as a date and window shape as shape1 (sh1). The building orientation is depending on the window direction, so that author chooses the East orientating (E), (referring figure 19). After that, the author changes the position to (P5) and the time is t=15. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one, the author starts the process and the outcome as show in the table 33 below to get into the simulation results.

Table 33: Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P5) and (T15).

Glare rating	Maximum luminance = 1870 cd/m² - Threshold 451.04 cd/m²							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	15.82%							314%
perceptible		20.52					23.03	
disturbing			23.1	23.72		153.68		
intolerable					38.76			

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 15.82%, DGI (21.49). In addition, the UGR is (24.41), CGI it is (26.27), GVCP reading (25.17). the BRS (23.52) has a relation with DGI, which means the BRS is perceptible, and the GDGR (205.37) has a relation with CGI so that it is intolerable which has an impact on the zone’s users. The threshold at that condition is 987.61 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 3647 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(1870 - 451.04\,)}{451.04} \times 100 = 314\%$$

Here is the result of P5 comes near to the results of P4, GTD is 314%.

After this result, it still not satisfying so that the author will add more position and keep the time as before T9, T12and T15.

The positions will be as a (figure 19), now the simulation will be on the position P5.

10- Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P6) and (T7).

In the approach of understanding the glare and analyse it. The author choses the variables which are, jun21 as a date and window shape as shape1 (sh1). The building orientation is depending on the window direction, so that author chooses the East orientating (E), (referring figure 18). After that, the author changes the position to (P6) and the time is t=7 The simulation starts at this time to have the ability to calculate the glare either direct or reflected one, the author starts the process and the outcome as show in the table 34 below to get into the simulation results.

Table 34: Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P6) and (T7).

Glare rating	Maximum luminance = 7821 cd/m² - Threshold 6900.80 cd/m²							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible		3.64	8.58	12.33	93.36	93.63	4.02	13.33%
perceptible	38.97%							
disturbing								
intolerable								

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes perceptible 38.97%, DGI (3.64). In addition, the UGR is (8.58), CGI it is (12.33), GVCP reading (93.63).

The BRS (4.02) has a relation with DGI, which means the BRS is perceptible, and the GDGR (39.73) has a relation with CGI so that it is perceptible which has an impact on the zone's users. The threshold at that condition is 6900.80 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 7821 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(7821 - 6900.80\ )}{6900.80} \times 100 = 13.33\%$$

After implementing the GTD formula the results become 13.33%.

11- Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P6) and (T9).

In the approach of understanding the glare and analyse it. The author choses the variables which are, jun21 as a date and window shape as shape1 (sh1). The building orientation is depending on the window direction, so that author chooses the East orientating (E), (referring figure 19). After that, the author changes the position to (P6) and the time is t=9. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one, the author starts the process and the outcome as show in the table 35 below to get into the simulation results.

Table 35: Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P6) and (T9).

	Maximum luminance = 7385 cd/m² - Threshold 2410.52 cd/m²							
Glare rating	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	25.71%							206.36%
perceptible		18.12	21.25				19.07	
disturbing				25.25		164.44		
intolerable					35.38			

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes perceptible 25.71%, DGI (18.12). In addition, the UGR is (21.25), CGI it is (25.25), GVCP reading (35.38). The BRS (19.07) has a relation with DGI, which means the BRS is perceptible, and the GDGR (164.44) has a relation with CGI so that it is intolerable which has an impact on the zone's users. The threshold at that condition is 2410.52 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 7385 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(7385 - 2410.52\ )}{2410.52} \times 100 = 206.3\%$$

After implementing the GTD formula the results become 206%

12- Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P6) and (T12).

In the approach of understanding the glare and analyse it. The author choses the variables which are, jun21 as a date and window shape as shape1 (sh1). The building orientation is depending on the window direction, so that author chooses the East orientating (E), (referring figure 19). After that, the author changes the position to (P6) and the time is t=12. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one, the author starts the process and the outcome as show in the table 36 below to get into the simulation results.

Table 36: Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P6) and (T12).

Glare rating	Maximum luminance = 3819 cd/m² - Threshold 899.87 cd/m²							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	23.55%							324%
perceptible		22.13					24.65	
disturbing			25.36	26.65		210.67		
intolerable					24.11			

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes perceptible 23.55%, DGI (22.13). In addition, the UGR is (25.36), CGI it is (26.65), GVCP reading (24.11). The BRS (24.65) has a relation with DGI, which means the BRS is perceptible, and the GDGR (210.67) has a relation with CGI so that it is intolerable which has an impact on the zone's users. The threshold at that condition is 899.87 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 3819 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(3819 - 899.87)}{899.87} \times 100 = 324\%$$

After implementing the GTD formula the results become significantly high as 324%.

1- Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P6) and (T15).

In the approach of understanding the glare and analyse it. The author choses the variables which are, jun21 as a date and window shape as shape1 (sh1). The building orientation is depending on the window direction, so that author chooses the East orientating (E), (referring figure 19). After that, the author changes the position to (P6) and the time is t=15. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one, the author starts the process and the outcome as show in the table 37 below to get into the simulation results.

Table 37: Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P6) and (T15).

Glare rating	Maximum luminance = 1947 cd/m² - Threshold 402.63 cd/m²							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	16.87%							383%
perceptible		20.94					23.93	
disturbing			23.83	23.80		153.97		
intolerable					38.66			

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes perceptible 16.87%, DGI (20.94). In addition, the UGR is (23.83), CGI it is (23.8), GVCP reading (38.66). The BRS (23.93) has a relation with DGI, which means the BRS is perceptible, and the GDGR (153.97) has a relation with CGI so that it is intolerable which has an impact on the zone's users. The threshold at that condition is 402.63 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 1947 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(1947 - 402.63)}{402.63} \times 100 = 383\%$$

After implementing the GTD formula the results become significantly high as 383%.

Finding:

- summary of GTD in the different sky conditions.

The results of the simulation show that most of the illuminance and glare comes in the position 4 even the sky condition is not giving the high level of light as the date is 21jun. the glare threshold differential (GTD) shows that even if there is no glare but the maximum luminance is high which allow the daylight to penetrate into the office without causing distraction or discomfort in term of glare. The higher GTD the better daylight penetrates into the room but with a possibility to occur a discomfort environment. On the other hand, the lower GTD the less daylight penetrates inside the office room.

Table 38: summary of GTD in the different positions in clear sky conditions Jun 21, (sh1), (E).

TIME	GTD in the Jun 21, (sh1), (E), and clear sky condition.			
	P1	**P2**	**P3**	**P4**
T:9	150%	25%	174%	111%
T:12	150%	-45%	190%	120%
T:15	175%	-51%	210%	201%

The difference in the result between the p1 and p3 comes because of the sun path. The window in the building is facing the East refer figure 22 below. The position 2 shows less reading which means no direct glare comes to the observer's eye while the light is useful in the visual environment. Due to the results, it is obvious that the P4 is the is the position that the observer's eye receives the light and glare where, he is facing the window on the east direction. Because of that the author did the simulation in the three different sky conditions in P4 and then compared them as shows in the table below. (table 38).

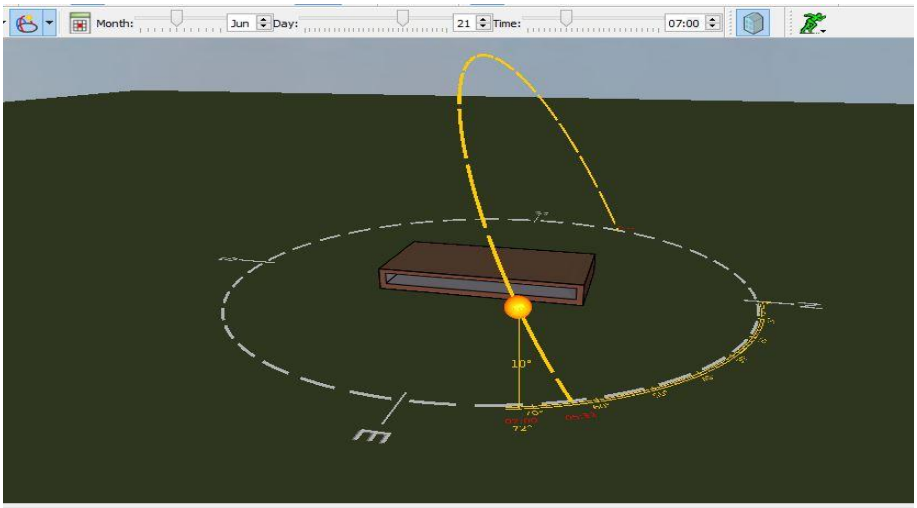


Figure 23 : sun path in Jun 21, E

The illuminance angel is different to the observer between p1 and p3, that's why there is a difference in the GTD in those two positions.

- summary of GTD in the different sky conditions Jun 21, (sh1), (E), (P4)

After the results from clear sky condition the author found most of the illuminance penetrate into the occupant in the office room comes in the P4, therefore, he is going to compare all sky conditions in the P4. As below in (table 39).

Table 39: summary of GTD in the different sky conditions Jun 21, (sh1), (E), (P4)

TIME	GTD in the different sky conditions Jun 21, (sh1), (E), (P4)		
	Clear sky	**Intermediate sky with sun**	**Sunny sky**
T:9	111%	31%	34%
T:12	120%	54%	76%
T:15	201%	61%	87%

The threshold is low in clear sky and the difference between maximum illuminance and the glare threshold is high. On the other hand, the position 4 shows that the sunny sky get more daylight even though the glare is more and the glare threshold is more so the threshold increases in sunny sky and decreases in clear sky.

After that the author did a simulation in sunny sky and P4 only but add more times.

- summary of GTD in the different time in sunny sky condition Jun 21, (sh1), (E), (P4)

The table below shows the difference in the GDT between five times in the same day and position. The results demonstrate that at the morning the probability for occurring glare is 0.00 and the results says that since it is -12 and -16. It means the direct light and the maximum illuminance is less than the glare threshold which means, no possibility of discomfort. Going to the sunset we can notice the GDT is going high which means the illuminance penetrates to the observer is much high than the glare threshold, it doesn’t mean direct light it means illuminance which can be indirect daylight but at the end no possibility of glare. The author noticed that in most of the simulations happened in all conditions and positions not only the DGP or DGI is responsible to measure the discomfort in a certain zones, because some results shows that the DGP is imperceptible but at the same time other results CVP or UGR or CGI are showing intolerable like (table27), (table 28) and (table 34).

Table 40: summary of GTD in the different time in sunny sky condition Jun 21, (sh1), (E), (P4)

GTD in the different time in sunny sky condition Jun 21, (sh1), (E), (P4)					
TIME	T:7	T:8	T:9	T:12	T:15
GTD	-12%	-16%	34%	76%	87%

After this simulation in this condition the author decided to add more position and he did P5.

- summary of GTD in the different time in sunny sky condition Jun 21, (sh1), (E), (P5)

The table below shows the difference in the GDT between four times in the same day and position. The results demonstrate that at the morning the probability for occurring glare is less than the afternoon time. It means the difference between the maximum illuminance and the glare threshold is small while at the afternoon time it's obvious, the GDT gives results above 100% which means the maximum illuminance is extremely high than the glare threshold. The direct light and the maximum illuminance are high but it doesn't effect the employers and make a discomfort environment and that is due to the position which means, no possibility of discomfort. Going to the sunset we can notice the GDT is going high which means the illuminance penetrates to the observer is much high than the glare threshold, it doesn't mean direct light it means illuminance which can be indirect daylight but at the end no possibility of glare. The author noticed that also in P5 simulations not only the DGP or DGI is responsible to measure the discomfort in a certain zone, because some results shows that the DGP is imperceptible but at the same time other results CVP or UGR or CGI are showing intolerable.

Table 41: summary of GTD in the different time in sunny sky condition Jun 21, (sh1), (E), (P5)

GTD in the different time in sunny sky condition Jun 21, (sh1), (E), (P5)				
TIME	T:7	T:9	T:12	T:15
GTD	32.7%	19%	269%	314%

- summary of GTD in the different time in sunny sky condition Jun 21, (sh1), (E), (P6)

The table below shows the difference in the GDT between four times in the same day and position. The results demonstrate that at the morning the probability for occurring glare is less than the afternoon time. It means the difference between the maximum illuminance and the glare threshold is small while at the afternoon time it's obvious, the GDT gives results above 100% which means the maximum illuminance is extremely high than the glare threshold. The direct light and the maximum illuminance are high but it doesn't effect the employers and make a discomfort environment and that is due to the position which means, no possibility of discomfort. Going to the sunset we can notice the GDT is going high which means the illuminance penetrates to the observer is much high than the glare threshold, it doesn't mean direct light it means illuminance which can be indirect daylight but at the end no possibility of glare. The author noticed that also in P5 simulations not only the DGP or DGI is responsible to measure the discomfort in a certain zone, because some results shows that the DGP is imperceptible but at the same time other results CVP or UGR or CGI are showing intolerable.

Table 42: summary of GTD in the different time in sunny sky condition Jun 21, (sh1), (E), (P6)

GTD in the different time in sunny sky condition Jun 21, (sh1), (E), (P6)				
TIME	T:7	T:9	T:12	T:15
GTD	13.33%	206%	324%	383%

- summary of GTD in the different positions and times in sunny sky condition Jun 21, (E).

  The table below shows the difference in the GDT between the different positions P4, P5 and P6, also at the different times T7, T9, T12 and T15. The results demonstrate that at the morning the probability for occurring glare is less than the afternoon time in all positions. It means the difference between the maximum illuminance and the glare threshold is small. The GDT of P4 is totally different than P5 and P6, as demonstrated in the table below at t7 the probability occurring glare in p4 is zero since the GTD in negative, where in p5 and p6 the probability is low, which means the maximum illuminance received by observer's eye is higher in p5 and p6. The direct light and the maximum illuminance are high but it doesn't effect the employers and make a discomfort environment and that is due to the position which means, no possibility of discomfort glare. the illuminance penetrates to the observer is much higher than the glare threshold in the afternoon time, it doesn't mean direct light it means illuminance which can be indirect daylight but at the end no possibility of glare. The author noticed that also in simulations not only the DGP or DGI is responsible to measure the discomfort in a certain zone, because some results shows that the DGP is imperceptible but at the same time other results CVP or UGR or CGI are showing intolerable.

Table 43: summary of GTD in the different positions and times in sunny sky condition Jun 21, (E).

GTD in the different positions and times in sunny sky condition Jun 21, (E).			
TIME	**P4**	**P5**	**P6**
T:7	-12%	32.7%	13.33%
T:9	34%	19%	206.36%
T:12	76%	269%	324%
T:15	87%	314%	383%

4.2 Simulation in Jun 21 South orientation.

This day is the tallest day in the entire year. The author chose to do the simulation after rotating the building and keep the window opining facing the South direction. This orientation will keep the opining far away from the sun path same as shown in the figure below.

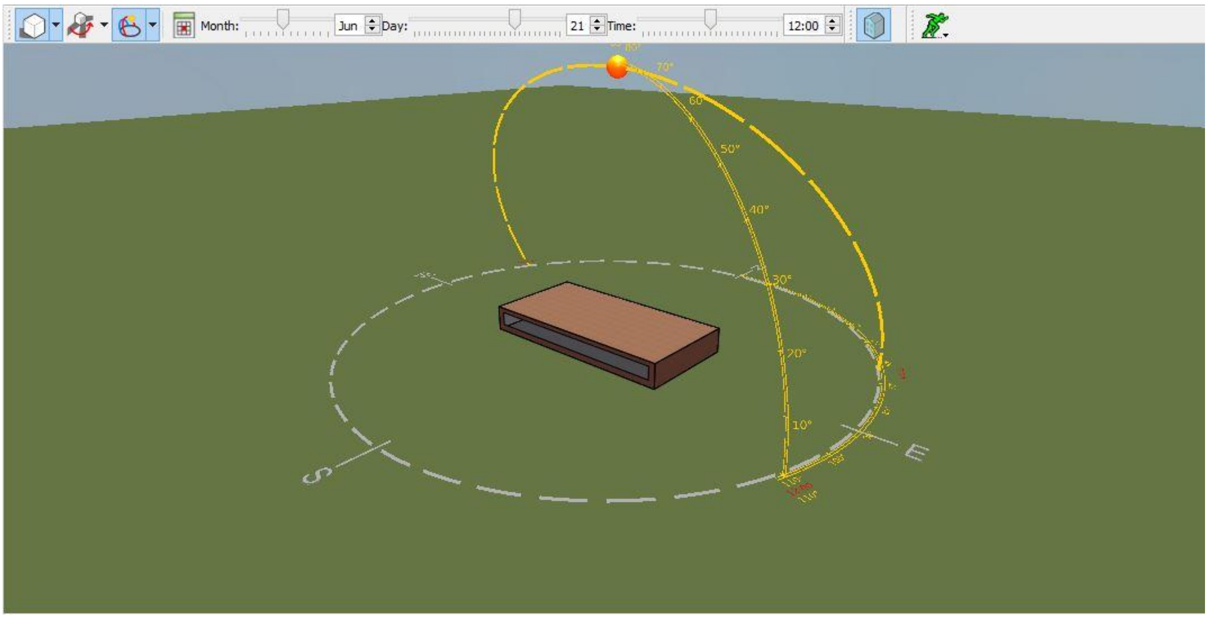


Figure 24: sun path while the widow directed to south direction.

Radiance engine can be considered as a main engine in this paper and analysing process where, all most of the Parameters can applied in this stage such as a SDA, ASE, time and date, and to be accurate the ASE will be used in the simulation process as it is responsible to calculate the direct sunlight and the glare calculation . In addition, the photorealistic images can get either isometric picture, hemispheric fish eye or plane. Apart from that, the sky condition is important since it has direct impact and highly effect in the glare and luminance output.

Finally, in the simulated results the display is picture, this picture gives the reading assumed as human eye.

There are three main deferent sky conditions, but in this past the author decided to keep on doing the simulation in the sunny sky as it is the ideal sky condition suitable to simulate the actual life in Dubai summer.

4.2.1 Sky condition (Sunny sky),

In the simulation, the sky condition will set in the IESVE software as sunny sky. Time will set 7, 9,12 and 15, and the date will set 21 Jun, the orientation of the building will set the window toward South, after that the position is P4, P5 and P6.

The scale for the glare rating system in order to refer the results to the stander scale.

1- Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P4) and (T7).

In the approach of understanding the glare and analyse it. The author changes the direction of the window to (S). After that, the author keeps the position (P4) and the time is t=7. This all comes in the approach of figuring out the glare and understanding the luminance and sunlight behaviour and its impact on the employers in the office time as it is in the most of the offices in Dubai starts from 8 to 15. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as show in the table 44 below to get into the simulation results.

Table 44: Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P4) and (T7).

Glare rating	Maximum luminance =1927 cd/m² - Threshold 647.97 cd/m²							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	25.03%							197%
perceptible								
disturbing		22.87					27.52	
intolerable			28.86	28.1	1.93	591.56		

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 25.03%, the glare is not disturbing the occupant's eye at all, also not causing any distraction. The other metrics is important, DGI reading is (22.87), which means it is fine to the zone's users and reached to the disturbing point. In addition, the UGR is disturbing (28.86) as per the standard scale. When check the result of CGI it is (28.1), which means it is intolerable as per the scale. GVCP the reading (1.93) shows intolerable result and this effect the occupant's comfort. The BRS (27.52) has a relation with DGI, which means the BRS is perceptible, and the GDGR (591.56) has a relation with CGI so that it is disturbing which has an impact on the zone's users. The threshold at that condition is 647.97 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 1927 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(1927 - 647.97)}{647.97} \times 100 = 197\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes above 100%.

2- Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P4) and (T9).

In the approach of understanding the glare and analyse it. The author changes the direction of the window to (S). After that, the author keeps the position (P4) and the time is t=9. This all comes in the approach of figuring out the glare and understanding the luminance and sunlight behaviour and its impact on the employers in the office time as it is in the most of the offices in Dubai starts from 8 to 15. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as show in the table 45 below to get into the simulation results.

Table 45: Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P4) and (T9).

Glare rating	Maximum luminance =2432 cd/m² - Threshold 809.22 cd/m²							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	26.01%							200%
perceptible		23.5					27.89	
disturbing								
intolerable			29.54	29.57	1.24	675.45		

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 26.01%, the glare is not disturbing the occupant's eye at all, also not causing any distraction. The other metrics is important, DGI reading is (23.5), which means it is fine to the zone's users and reached to the disturbing point. In addition, the UGR is disturbing (29.54) as per the standard scale. When check the result of CGI it is (29.57), which means it is intolerable as per the scale. GVCP the reading (1.24) shows intolerable result and this effect the occupant's comfort. The BRS (27.89) has a relation with DGI, which means the BRS is perceptible, and the GDGR (674.45) has a relation with CGI so that it is disturbing which has an impact on the zone's users. The threshold at that condition is 809.22 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 2432 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(2432 - 809.22)}{809.22} \times 100 = 200\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes above 100%.

3- Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P4) and (T12).

The author changes the direction of the window to (S). After that, the author keeps the position (P4) and the time is t=12. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as show in the table 46 below to get into the simulation results.

Table 46: Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P4) and (T12).

	Maximum luminance = 3628 cd/m² - Threshold 1670.44 cd/m²							
Glare rating	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	30.19%							117%
perceptible								
disturbing		25.11					29.17	
intolerable			31.24	33.43	0.31	982.34		

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 30.19%, the glare is not disturbing the occupant's eye at all, also not causing any distraction. The other metrics is important, DGI reading is (25.11), which means it is fine to the zone's users and reached to the disturbing point. In addition, the UGR is disturbing (31.24) as per the standard scale. When check the result of CGI it is (33.43), which means it is intolerable as per the scale. GVCP the reading (0.31) shows intolerable result and this effect the occupant's comfort. The BRS (29.17) has a relation with DGI, which means the BRS is perceptible, and the GDGR (982.34) has a relation with CGI so that it is disturbing which has an impact on the zone's users. The threshold at that condition is 1670.44 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 3628 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(3628 - 1670.44)}{1670.44} \times 100 = 117\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes above 100%.

4- Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P4) and (T15).

The author changes the direction of the window to (S). After that, the author keeps the position (P4) and the time is t=15. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as demonstrated in the table 47 below to get into the simulation results.

Table 47: Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P4) and (T15).

Glare rating	Maximum luminance = 1933 cd/m² - Threshold 831.31 cd/m²							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	26.13%							117%
perceptible		23.49					27.75	
disturbing								
intolerable			29.46	29.66	1.21	680.51		

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 26.13%, the glare is not disturbing the occupant's eye at all, also not causing any distraction. The other metrics is important, DGI reading is (23.49), which means it is fine to the zone's users and reached to the disturbing point. In addition, the UGR is disturbing (29.46) as per the standard scale. When check the result of CGI it is (29.66), which means it is intolerable as per the scale. GVCP the reading (1.21) shows intolerable result and this effect the occupant's comfort. The BRS (27.75) has a relation with DGI, which means the BRS is perceptible, and the GDGR (680.51) has a relation with CGI so that it is disturbing which has an impact on the zone's users. The threshold at that condition is 831.31 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 1933cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(1933\ - 831.31)}{831.31} \times 100 = 170\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes above 100%.

5- Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P5) and (T7).

The author changes the direction of the window to (S). After that, the author keeps the position (P5) and the time is t =7. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as demonstrated in the table 48 below to get into the simulation results.

Table 48: Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P5) and (T7).

	Maximum luminance = 1307 cd/m² - Threshold 299.6 cd/m²							
Glare rating	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	11.07%							336%
perceptible		20.37					23.45	
disturbing			23.04	22.6	44.59	137.26		
intolerable								

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 11.07%, the glare is not disturbing the occupant's eye at all, also not causing any distraction. The other metrics is important, DGI reading is (20.37), which means it is fine to the zone's users and reached to the disturbing point. In addition, the UGR is disturbing (23.04) as per the standard scale. When check the result of CGI it is (22.6), which means it is disturbing as per the scale. GVCP the reading (44.59) shows disturbing result and this effect the occupant's comfort. The BRS (23.45) has a relation with DGI, which means the BRS is perceptible, and the GDGR (137.26) has a relation with CGI so that it is disturbing which has an impact on the zone's users. The threshold at that condition is 299.6 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 1307 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(1307 - 299.6)}{299.6} \times 100 = 336\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes above 100%.

6- Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P5) and (T9).

The author changes the direction of the window to (S). After that, the author keeps the position (P5) and the time is t =9. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as demonstrated in the table 49 below to get into the simulation results.

Table 49: Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P5) and (T9).

	Maximum luminance = 1830 cd/m² - Threshold 393.67 cd/m²							
Glare rating	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	17.34%							336%
perceptible		20.89					23.74	
disturbing			23.66	23.7		156.05		
intolerable					37.98			

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 17.34%, the glare is not disturbing the occupant's eye at all, also not causing any distraction. The other metrics is important, DGI reading is (20.89), which means it is fine to the zone's users and reached to the disturbing point. In addition, the UGR is disturbing (23.66) as per the standard scale. When check the result of CGI it is (23.7), which means it is disturbing as per the scale. GVCP the reading (37.98) shows intolerable result and this effect the occupant's comfort. The BRS (23.74) has a relation with DGI, which means the BRS is perceptible, and the GDGR (156.05) has a relation with CGI so that it is disturbing which has an impact on the zone's users. The threshold at that condition is 393.67 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 1830 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(1830 \; - 393.67)}{393.67} \times 100 = 339\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes above 100%.

7- Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P5) and (T12).

The author changes the direction of the window to (S). After that, the author keeps the position (P5) and the time is t = 12. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as demonstrated in the table 50 below to get into the simulation results.

Table 50: Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P5) and (T12).

Glare rating	Maximum luminance = 1830 cd/m² - Threshold 393.67 cd/m²							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	23.4%							346%
perceptible		22.49					25.17	
disturbing			25.77	26.78		217.89		
intolerable					22.74			

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 23.4%, the glare is not disturbing the occupant's eye at all, also not causing any distraction. The other metrics is important, DGI reading is (22.49), which means it is fine to the zone's users and reached to the disturbing point. In addition, the UGR is disturbing (25.77) as per the standard scale. When check the result of CGI it is (26.78), which means it is disturbing as per the scale. GVCP the reading (22.74) shows intolerable result and this effect the occupant's comfort. The BRS (25.17) has a relation with DGI, which means the BRS is perceptible, and the GDGR (217.89) has a relation with CGI so that it is disturbing which has

an impact on the zone's users. The threshold at that condition is 838.92 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 3745 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(3745 \ - 838.92)}{838.92} \times 100 = 346\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes above 100%.

8- Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P5) and (T15).

The author changes the direction of the window to (S). After that, the author keeps the position (P5) and the time is t = 15. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as demonstrated in the table 51 below to get into the simulation results.

Table 51: Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P5) and (T15).

Glare rating	**Maximum luminance = 1830 cd/m² - Threshold 393.67 cd/m²**							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	20.28%							373%
perceptible		21.45					24.39	
disturbing			24.42	24.5		170.98		
intolerable					33.48			

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 20.28%, the glare is not disturbing the occupant's eye at all, also not causing any distraction. The other metrics is important, DGI reading is (21.45), which means it is fine to the zone's users and reached to the disturbing point. In addition, the UGR is disturbing (24.42) as per the standard scale. When check the result of CGI it is (24.5), which means it is disturbing as per the scale. GVCP the reading (33.48) shows intolerable result and this effect the occupant's comfort. The BRS (24.39) has a relation with DGI, which means the BRS is perceptible, and the GDGR (170.98) has a relation with CGI so that it is disturbing which has an impact on the zone's users. The threshold at that condition is 468.07 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 2219 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(2219\ - 468.07)}{468.07} \times 100 = 373\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes above 100%.

9- Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P6) and (T7).

The author changes the direction of the window to (S). After that, the author keeps the position (P6) and the time is t = 7. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as demonstrated in the table 52 below to get into the simulation results.

Table 52: Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P6) and (T7).

	Maximum luminance = 1830 cd/m² - Threshold 393.67 cd/m²							
Glare rating	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	14.30%							457%
perceptible		20.82					23.99	
disturbing			23.65	23.17	40.99	147.09		
intolerable								

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 14.30%, the glare is not disturbing the occupant's eye at all, also not causing any distraction. The other metrics is important, DGI reading is (20.82), which means it is fine to the zone's users and reached to the disturbing point. In addition, the UGR is disturbing (23.65) as per the standard scale. When check the result of CGI it is (23.17), which means it is disturbing as per the scale. GVCP the reading (40.99) shows intolerable result and this effect the occupant's comfort. The BRS (23.99) has a relation with DGI, which means the BRS is perceptible, and the GDGR (147.09) has a relation with CGI so that it is disturbing which has an impact on the zone's users. The threshold at that condition is 338.94 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it

is 1890 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(1890\ - 338.94)}{338.94} \times 100 = 457\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes above 100%

10- Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P6) and (T9).

The author changes the direction of the window to (S). After that, the author keeps the position (P6) and the time is t = 9. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as demonstrated in the table 53 below to get into the simulation results.

Table 53: Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P6) and (T9).

	Maximum luminance = 2180 cd/m² - Threshold 474.6 cd/m²							
Glare rating	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	20.40%							359%
perceptible		21.49					24.46	
disturbing			24.48	24.53		172		
intolerable					33.19			

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 20.40%, the glare is not disturbing the occupant's eye at all, also not causing any distraction. The other metrics is important, DGI reading is (21.49), which means it is fine to the zone's users and reached to the disturbing point. In addition, the UGR is disturbing (24.48) as per the standard scale. When check the result of CGI it is (24.53), which means it is disturbing as per the scale. GVCP the reading (33.19) shows intolerable result and this effect the occupant's comfort. The BRS (24.46) has a relation with DGI, which means the BRS is perceptible, and the GDGR (172) has a relation with CGI so that it is disturbing which has an impact on the zone's users. The threshold at that condition is 474.6 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 2180cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(2180\ - 474.6)}{474.6} \times 100 = 359\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes above 100%.

11- . Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P6) and (T12).

The author changes the direction of the window to (S). After that, the author keeps the position (P6) and the time is t = 12. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as demonstrated in the table 54 below to get into the simulation results.

Table 54: Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P6) and (T12).

Glare rating	Maximum luminance = 3794 cd/m² - Threshold 886.54 cd/m²							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	23.47%							327%
perceptible		22.54					25.23	
disturbing			25.86	26.91		221.42		
intolerable					22.11			

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 23.47%, the glare is not disturbing the occupant’s eye at all, also not causing any distraction. The other metrics is important, DGI reading is (22.54), which means it is fine to the zone’s users and reached to the disturbing point. In addition, the UGR is disturbing (25.86) as per the standard scale. When check the result of CGI it is (26.91), which means it is disturbing as per the scale. GVCP the reading (22.11) shows intolerable result and this effect the occupant’s comfort. The BRS (25.23) has a relation with DGI, which means the BRS is perceptible, and the GDGR (221.42) has a relation with CGI so that it is disturbing which has an impact on the zone’s users. The threshold at that condition is 886.54 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 3794 cd/m² and these two readings is important in the introduced metrics (GTD) to

understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(3794 \ - 886.54)}{886.54} \times 100 = 327\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes above 100%.

12- . Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P6) and (T15).

The author changes the direction of the window to (S). After that, the author keeps the position (P6) and the time is t = 15. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as demonstrated in the table 55 below to get into the simulation results.

Table 55: Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P6) and (T15).

Glare rating	Maximum luminance = 1818 cd/m² - Threshold 412.96 cd/m²							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	17.87%							340%
perceptible		20.87					23.66	
disturbing			23.62	23.74		157.14		
intolerable					37.64			

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 17.87%, the glare is not disturbing the occupant’s eye at all, also not causing any distraction. The other metrics is important, DGI reading is (20.87), which means it is fine to the zone’s users and reached to the disturbing point. In addition, the UGR is disturbing (23.62) as per the standard scale. When check the result of CGI it is (23.74), which means it is disturbing as per the scale. GVCP the reading (37.64) shows intolerable result and this effect the occupant’s comfort. The BRS (23.66) has a relation with DGI, which means the BRS is perceptible, and the GDGR (157.14) has a relation with CGI so that it is disturbing which has an impact on the zone’s users. The threshold at that condition is 412.96 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 1818 cd/m² and these two readings is important in the introduced metrics (GTD) to

understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(1818\ - 412.96)}{412.96} \times 100 = 340\%$$

When implementing the new metric on the results, which has been introduced by the author, the GTD become above 100%

4.2.2 Sky condition (Overcast sky).

In the simulation, the sky condition will set in the IESVE software as sunny sky, and the position will change in each process 90°. Time will set 7, 9, 12 and 15, and the date will set 21 Jun, the orientation of the building will set the window toward South, after that the shape of the window is shape 1 and position is P4, P5 and P6.

The scale for the glare rating system in order to refer the results to the stander scale.

1- . Daylight and Glare Analysis for Jun 21, (overcast sky), (S), (P6) and (T7).

The author starts the direction of the window toward (S). After that, the author keeps the position (P6) and the time is t = 7. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as demonstrated in the table 56 below to get into the simulation results.

Table 56: Daylight and Glare Analysis for Jun 21, (overcast sky), (S), (P6) and (T7).

	Maximum luminance = 621 cd/m² - Threshold 178.1 cd/m²							
Glare rating	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	3.06%	16.19					18.02	248%
perceptible			17.49	18.21	70.64	82.15		
disturbing								
intolerable								

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 3.06%, the glare is not disturbing the occupant's eye at all, also not causing any distraction. The other metrics is important, DGI reading is (16.19), which means it is fine to the zone's users and not reached to the disturbing point. In addition, the UGR is imperceptible (17.49) as per the standard scale. When check the result of CGI it is (18.21), which means it is perceptible as per the scale. GVCP the reading (70.64) shows perceptible result and this not effecting the occupant's comfort. The BRS (18.02) has a relation with DGI, which means the BRS is perceptible, and the GDGR (82.15) has a relation with CGI so that it is disturbing which has an impact on the zone's users. The threshold at that condition is 178.1 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 621 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(621 \; - 178.1)}{178.1} \times 100 = 248\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes above 100%.

2- . Daylight and Glare Analysis for Jun 21, (overcast sky), (S), (P6) and (T9).

The author starts the direction of the window toward (S). After that, the author keeps the position (P6) and the time is t = 9. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as demonstrated in the table 57 below to get into the simulation results.

Table 57: Daylight and Glare Analysis for Jun 21, (overcast sky), (S), (P6) and (T9).

	Maximum luminance = 1358 cd/m² - Threshold 385.83 cd/m²							
Glare rating	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	15.22%							251%
perceptible		18.24	20.22	21.33		120.91	20.07	
disturbing					51.26			
intolerable								

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 15.22%, the glare is not disturbing the occupant's eye at all, also not causing any distraction. The other metrics is important, DGI reading is (18.24), which means it is fine to the zone's users and not reached to the disturbing point. In addition, the UGR is imperceptible (20.22) as per the standard scale. When check the result of CGI it is (21.33), which means it is perceptible as per the scale. GVCP the reading (51.26) shows disturbing result and this effect the occupant's comfort. The BRS (20.07) has a relation with DGI, which means the BRS is perceptible, and the GDGR (120.91) has a relation with CGI so that it is disturbing which has an impact on the zone's users. The threshold at that condition is 385.83 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 1358 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(1358 \; - 385.83)}{385.83} \times 100 = 248\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes above 100%.

3- . Daylight and Glare Analysis for Jun 21, (overcast sky), (S), (P6) and (T12).

The author starts the direction of the window toward (S). After that, the author keeps the position (P6) and the time is t = 12. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as demonstrated in the table 58 below to get into the simulation results.

Table 58: Daylight and Glare Analysis for Jun 21, (overcast sky), (S), (P6) and (T12).

	Maximum luminance = 1914 cd/m² - Threshold 545.58 cd/m²							
Glare rating	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	20.37%							250%
perceptible		19.14	21.43	22.79		143.23	20.98	
disturbing					42.37			
intolerable								

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 20.37%, the glare is not disturbing the occupant's eye at all, also not causing any distraction. The other metrics is important, DGI reading is (19.14), which means it is fine to the zone's users and not reached to the disturbing point. In addition, the UGR is imperceptible (21.43) as per the standard scale. When check the result of CGI it is (22.79), which means it is perceptible as per the scale. GVCP the reading (42.37) shows disturbing result and this effect the occupant's comfort. The BRS (20.98) has a relation with DGI, which means the BRS is perceptible, and the GDGR (143.23) has a relation with CGI so that it is disturbing which has

an impact on the zone's users. The threshold at that condition is 545.58 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 1914 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(1914\ - 545.58)}{545.58} \times 100 = 250\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes above 100%.

4- . Daylight and Glare Analysis for Jun 21, (overcast sky), (S), (P6) and (T15).

The author starts the direction of the window toward (S). After that, the author keeps the position (P6) and the time is t = 15. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as demonstrated in the table 59 below to get into the simulation results.

Table 59: Daylight and Glare Analysis for Jun 21, (overcast sky), (S), (P6) and (T15).

	Maximum luminance = 1549 cd/m² - Threshold 443.94 cd/m²							
Glare rating	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	17.88%							248%
perceptible		18.52	20.61	21.84		128.59	20.33	
disturbing					48.01			
intolerable								

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 17.88%, the glare is not disturbing the occupant's eye at all, also not causing any distraction. The other metrics is important, DGI reading is (18.52), which means it is fine to the zone's users and not reached to the disturbing point. In addition, the UGR is imperceptible (20.61) as per the standard scale. When check the result of CGI it is (21.84), which means it is perceptible as per the scale. GVCP the reading (48.01) shows disturbing result and this effect the occupant's comfort. The BRS (20.33) has a relation with DGI, which means the BRS is perceptible, and the GDGR (128.59) has a relation with CGI so that it is disturbing which has an impact on the zone's users. The threshold at that condition is 443.94 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 1549 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(1549 \ - 443.94)}{443.94} \times 100 = 248\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes above 100%.

5- . Daylight and Glare Analysis for Jun 21, (overcast sky), (S), (P5) and (T7).

The author changes the direction of the window toward (S). After that, the author also changes the position to (P5) and the time is t = 7. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as demonstrated in the table 60 below to get into the simulation results.

Table 60: Daylight and Glare Analysis for Jun 21, (overcast sky), (S), (P5) and (T7).

Glare rating	**Maximum luminance = 619 cd/m² - Threshold 176.05 cd/m²**							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	3.04%	16.17					18	251%
perceptible			17.47	18.2	70.91	81.66		
disturbing								
intolerable								

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 3.04%, the glare is not disturbing the occupant's eye at all, also not causing any distraction. The other metrics is important, DGI reading is (16.17), which means it is fine to the zone's users and not reached to the disturbing point. In addition, the UGR is imperceptible (17.47) as per the standard scale. When check the result of CGI it is (18.2), which means it is perceptible as per the scale. GVCP the reading (70.91) shows disturbing result and this effect the occupant's comfort. The BRS (18) has a relation with DGI, which means the BRS is perceptible, and the GDGR (81.66) has a relation with CGI so that it is disturbing which has an impact on the zone's users. The threshold at that condition is 176.05 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it

is 619 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(619 \ - 176.05)}{176.05} \times 100 = 251\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes above 100%.

6- Daylight and Glare Analysis for Jun 21, (overcast sky), (S), (P5) and (T9).

The author changes the direction of the window toward (S). After that, the author also changes the position to (P5) and the time is t = 9. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as demonstrated in the table 61 below to get into the simulation results.

Table 61: Daylight and Glare Analysis for Jun 21, (overcast sky), (S), (P5) and (T9).

Glare rating	Maximum luminance = 1347 cd/m² - Threshold 389.07 cd/m²							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	15.37%							246%
perceptible		18.16	20.14	21.29		119.71	19.96	
disturbing					51.79			
intolerable								

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 15.37%, the glare is not disturbing the occupant's eye at all, also not causing any distraction. The other metrics is important, DGI reading is (18.16), which means it is fine to the zone's users and not reached to the disturbing point. In addition, the UGR is imperceptible (20.14) as per the standard scale. When check the result of CGI it is (21.29), which means it is perceptible as per the scale. GVCP the reading (51.79) shows disturbing result and this effect the occupant's comfort. The BRS (19.96) has a relation with DGI, which means the BRS is perceptible, and the GDGR (119.71) has a relation with CGI so that it is disturbing which has an impact on the zone's users. The threshold at that condition is 389.07 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 1347 cd/m² and these two readings is important in the introduced metrics (GTD) to

understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(1347\ - 389.07)}{389.07} \times 100 = 246\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes above 100%.

7- Daylight and Glare Analysis for Jun 21, (overcast sky), (S), (P5) and (T12).

The author changes the direction of the window toward (S). After that, the author also changes the position to (P5) and the time is t = 12. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as demonstrated in the table 62 below to get into the simulation results.

Table 62: Daylight and Glare Analysis for Jun 21, (overcast sky), (S), (P5) and (T12).

Glare rating	Maximum luminance = 1899 cd/m² - Threshold 542.02 cd/m²							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	20.36%							250%
perceptible		19.09	21.36	22.75		142.07	20.90	
disturbing					42.79			
intolerable								

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 20.36%, the glare is not disturbing the occupant's eye at all, also not causing any distraction. The other metrics is important, DGI reading is (19.09), which means it is fine to the zone's users and not reached to the disturbing point. In addition, the UGR is perceptible (21.36) as per the standard scale. When check the result of CGI it is (22.75), which means it is perceptible as per the scale. GVCP the reading (42.79) shows disturbing result and this effect the occupant's comfort. The BRS (20.90) has a relation with DGI, which means the BRS is perceptible, and the GDGR (142.07) has a relation with CGI so that it is disturbing which has an impact on the zone's users. The threshold at that condition is 542.02 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 1899 cd/m² and these two readings is important in the introduced metrics (GTD) to

understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(1899 \ - 542.02)}{542.02} \times 100 = 250\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes above 100%.

8- Daylight and Glare Analysis for Jun 21, (overcast sky), (S), (P5) and (T15).

The author changes the direction of the window toward (S). After that, the author also changes the position to (P5) and the time is t = 15. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as demonstrated in the table 63 below to get into the simulation results.

Table 63: Daylight and Glare Analysis for Jun 21, (overcast sky), (S), (P5) and (T15).

Glare rating	Maximum luminance = 1545 cd/m² - Threshold 434.52 cd/m²							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	17.64%							250%
perceptible		18.62	20.73	21.90		128.69	20.48	
disturbing					47.97			
intolerable								

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 17.64%, the glare is not disturbing the occupant's eye at all, also not causing any distraction. The other metrics is important, DGI reading is (18.62), which means it is fine to the zone's users and not reached to the disturbing point. In addition, the UGR is perceptible (20.73) as per the standard scale. When check the result of CGI it is (21.90), which means it is perceptible as per the scale. GVCP the reading (47.97) shows disturbing result and this effect the occupant's comfort. The BRS (20.48) has a relation with DGI, which means the BRS is perceptible, and the GDGR (128.69) has a relation with CGI so that it is disturbing which has an impact on the zone's users. The threshold at that condition is 434.52 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 1545 cd/m² and these two readings is important in the introduced metrics (GTD) to

understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(1545 - 434.52)}{434.52} \times 100 = 255\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes above 100%.

9- Daylight and Glare Analysis for Jun 21, (overcast sky), (S), (P4) and (T7).

The author changes the direction of the window toward (S). After that, the author also changes the position to (P4) and the time is t = 7. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as demonstrated in the table 64 below to get into the simulation results.

Table 64: Daylight and Glare Analysis for Jun 21, (overcast sky), (S), (P4) and (T7).

Glare rating	Maximum luminance = 636 cd/m² - Threshold 360.22 cd/m²							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	20.95%							76%
perceptible		19.39					22.03	
disturbing			23.13	23.83		342.64		
intolerable					8.91			

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 20.95%, the glare is not disturbing the occupant's eye at all, also not causing any distraction. The other metrics is important, DGI reading is (19.39), which means it is fine to the zone's users and not reached to the disturbing point. In addition, the UGR is disturbing (23.13) as per the standard scale. When check the result of CGI it is (23.83), which means it is disturbing as per the scale. GVCP the reading (8.91) shows intolerable result and this effect the occupant's comfort. The BRS (22.03) has a relation with DGI, which means the BRS is perceptible, and the GDGR (342.64) has a relation with CGI so that it is disturbing which has an impact on the zone's users. The threshold at that condition is 360.22 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 636 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment.

In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(636 \ - 360.22)}{360.22} \times 100 = 76\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes below 100%.

10- Daylight and Glare Analysis for Jun 21, (overcast sky), (S), (P4) and (T9).

The author changes the direction of the window toward (S). After that, the author also changes the position to (P4) and the time is t = 9. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as demonstrated in the table 65 below to get into the simulation results.

Table 65: Daylight and Glare Analysis for Jun 21, (overcast sky), (S), (P4) and (T9).

Glare rating	Maximum luminance = 1374 cd/m² - Threshold 777.06 cd/m²							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	24.49%							76.8%
perceptible		21.4					24.03	
disturbing			26.08	27.27		527.24		
intolerable					2.77			

he results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 24.49%, the glare is not disturbing the occupant's eye at all, also not causing any distraction. The other metrics is important, DGI reading is (21.4), which means it is fine to the zone's users and not reached to the disturbing point. In addition, the UGR is disturbing (26.08) as per the standard scale. When check the result of CGI it is (27.27), which means it is disturbing as per the scale. GVCP the reading (2.77) shows intolerable result and this effect the occupant's comfort. The BRS (24.03) has a relation with DGI, which means the BRS is perceptible, and the GDGR (527.24) has a relation with CGI so that it is disturbing which has an impact on the zone's users. The threshold at that condition is 777.06 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it

is 1374 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(1374 \ - 777.02)}{777.02} \times 100 = 76.8\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes below 100%.

11- Daylight and Glare Analysis for Jun 21, (overcast sky), (S), (P4) and (T12).

The author changes the direction of the window toward (S). After that, the author also changes the position to (P4) and the time is t = 12. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as demonstrated in the table 66 below to get into the simulation results.

Table 66: Daylight and Glare Analysis for Jun 21, (overcast sky), (S), (P4) and (T12).

Glare rating	**Maximum luminance = 1935 cd/m² - Threshold 1094 cd/m²**							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	26.07%							76.8%
perceptible		22.31					24.95	
disturbing			27.29					
intolerable				29.38	1.5	639.11		

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 26.07%, the glare is not disturbing the occupant’s eye at all, also not causing any distraction. The other metrics is important, DGI reading is (22.31), which means it is fine to the zone’s users and not reached to the disturbing point. In addition, the UGR is disturbing (27.29) as per the standard scale. When check the result of CGI it is (29.38), which means it is intolerable as per the scale. GVCP the reading (1.5) shows intolerable result and this effect the occupant’s comfort. The BRS (24.95) has a relation with DGI, which means the BRS is perceptible, and the GDGR (639.11) has a relation with CGI so that it is disturbing which has an impact on the zone’s users. The threshold at that condition is 1094.1 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 1935 cd/m² and these two readings is important in the introduced metrics (GTD) to

understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(1935 \ - 1094.1)}{1094.1} \times 100 = 76.8\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes below 100%.

12- Daylight and Glare Analysis for Jun 21, (overcast sky), (S), (P4) and (T15).

The author changes the direction of the window toward (S). After that, the author also changes the position to (P4) and the time is t = 15. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as demonstrated in the table 67 below to get into the simulation results.

Table 67: Daylight and Glare Analysis for Jun 21, (overcast sky), (S), (P4) and (T15).

	Maximum luminance = 1568 cd/m² - Threshold 882.33 cd/m²							
Glare rating	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	25.04%							77.7%
perceptible		21.77					24.42	
disturbing			26.57					
intolerable				28.26	2.19	568.65		

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 25.04%, the glare is not disturbing the occupant's eye at all, also not causing any distraction. The other metrics is important, DGI reading is (21.77), which means it is fine to the zone's users and not reached to the disturbing point. In addition, the UGR is disturbing (26.57) as per the standard scale. When check the result of CGI it is (28.26), which means it is intolerable as per the scale. GVCP the reading (2.19) shows intolerable result and this effect the occupant's comfort. The BRS (24.42) has a relation with DGI, which means the BRS is perceptible, and the GDGR (568.65) has a relation with CGI so that it is disturbing which has an impact on the zone's users. The threshold at that condition is 882.33 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 1568 cd/m² and these two readings is important in the introduced metrics (GTD) to

understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(1568 \ - 882.33)}{882.33} \times 100 = 77.7\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes below 100%.

Finding:

- summary of GTD in the different sky conditions.(S)

Results in South orientation is different than East orientation. The results of the simulation show that most of the illuminance and glare comes in the position 4, even the sky condition is not giving the high level of light as the date is 21jun. The glare threshold differential (GTD) shows that even if there is no glare but the maximum luminance is high which allow the daylight to penetrate into the office without causing distraction or discomfort in term of glare. The higher GTD the better daylight penetrates into the room but with a possibility to occur a discomfort environment. On the other hand, the lower GTD the less daylight penetrates inside the office room. The below table shows the different GTD in the Jun 21, (S), and sunny sky condition

Table 68: summary of GTD in the different positions in sunny sky conditions Jun 21, (S).

TIME	GTD in the Jun 21, (S), and sunny sky condition.		
	P4	**P5**	**P6**
T:7	197%	336%	457%
T:9	200%	339%	359%
T:12	117%	346%	327%
T:15	170%	373%	340%

The difference in the result between the three positions comes because of the sun path. The window in the building is facing the South refer figure 25 below. Due to the results, it is obvious that the P4 is the position that the observer's eye receives the light and glare where, he is facing the window on the South direction. The percentage of the GTD comes from the difference between the maximum illuminance and the glare threshold comes to the observer eye. In the P6 and P5 the possibility of glare is very low because the glare threshold is low but the luminance penetrates is high, that's why the GTD is high. On the other hand, the metrics like UGR, CGI and VCP gives disturbing reading which means there is discomfort environment.

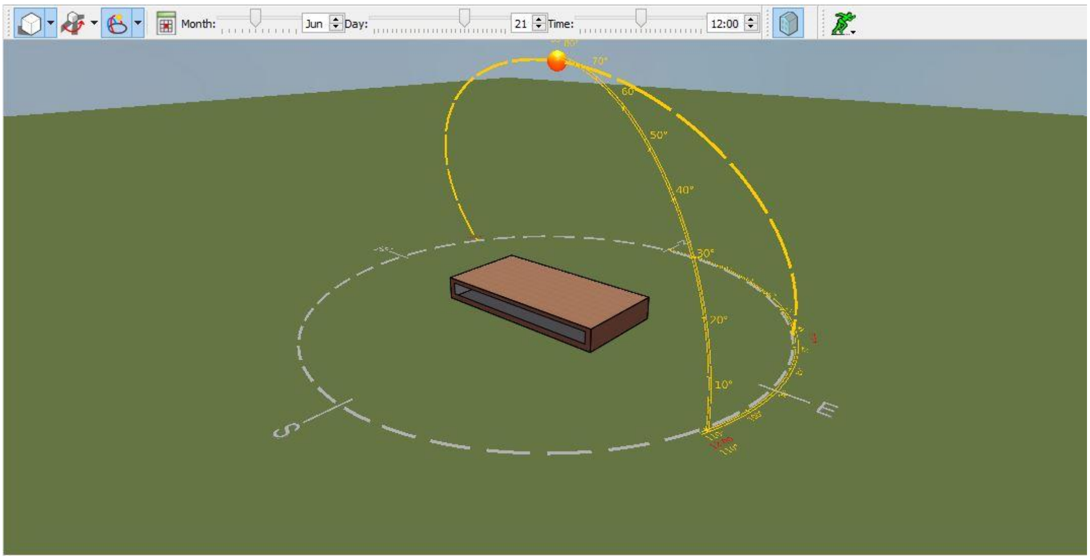


Figure 25 : sun path in Jun 21, S.at noontime

The direct light angel is different to the observer between p4, p5 and p6, that's why there is a difference in the GTD in those positions. The author did a simulation in a different sky condition which is overcast sky, trying to figure out the difference in term of glare and compare the results. The below table shows the results of the simulation and demonstrates the different GTD in the Jun 21, (S), and overcast sky condition

Table 69: summary of GTD in the different positions in overcast sky conditions Jun 21, (S).

TIME	GTD in the Jun 21, (S), and overcast sky condition.		
	P4	**P5**	**P6**
T:7	76%	251%	248%
T:9	77%	246%	251%
T:12	77%	250%	250%
T:15	78%	255%	248%

- summary of GTD in the different sky conditions Jun 21, (S), (P4)

the author found most of the illuminance penetrate into the occupant in the office room comes in the P4, because of the relation between position and the sun path, therefore, he is going to compare all sky conditions in the P4.

Table 70: summary of GTD in the different sky conditions Jun 21, (S), (P4).

TIME	GTD in the different sky conditions Jun 21, (S), (P4)	
	Overcast sky	**Sunny sky**
T:7	76%	197%
T:9	77%	200%
T:12	77%	117%
T:15	78%	170%

The threshold is low in sunny sky and the difference between maximum illuminance and the glare threshold is high in contrast to overcast sky. On the other hand, the position 4 shows that the observer gets more daylight in the sunny sky. Even though the glare is more and the glare threshold is high so the GTD increases in sunny sky and decreases in overcast sky.

After that the author did a simulation in sunny sky and P4 only but add more times.

- summary of GTD in the different time in sunny sky condition Jun 21, (S), (P4)

The table below shows the difference in the GDT between five times in the same day and position. The results demonstrate that at the morning the probability for occurring glare is low and the results says that. It means the maximum illuminance is near to the glare threshold which means, no possibility of discomfort glare, but still the other metrics shows that the discomfort environment is occur in all times in P4, and the. Going to the sunset we can notice the GDT is still in the same range this because of the observer receives light same amount from sunrise until sunset. which means the illuminance penetrates to the observer is moderate, it doesn't mean direct light it means illuminance which can be indirect daylight but at the end no possibility of glare. The author noticed that in most of the simulations happened in all conditions and positions not only the DGP or DGI is responsible to measure the discomfort in a certain zone, because some results shows that the DGP is imperceptible but at the same time other results CVP or UGR or CGI are showing intolerable.

Table 71: summary of GTD in the different time in sunny sky condition Jun 21, (S), (P4)

GTD in the different time in sunny sky condition Jun 21, (S), (P4)				
TIME	T:7	T:9	T:12	T:15
GTD	197%	200%	117%	170%

After this simulation in this condition the author decided to add more position and he did P5.

- summary of GTD in the different time in sunny sky condition Jun 21, (sh1), (S), (P5)

The table below shows the difference in the GDT between four times in the same day and position. The results demonstrate that at the morning and afternoon times have same probability for occurring glare is low and the results says that as most of the light is indirect. It means the maximum illuminance is extremally higher than the glare threshold which means, no possibility of discomfort glare, but still the other metrics shows that the discomfort environment is occur in all times in P5. Going to the sunset we can notice the GDT is still in the same range this because of the observer receives light same amount from sunrise until sunset. which means the illuminance penetrates to the observer is moderate, it doesn't mean direct light it means illuminance which can be indirect daylight but at the end no possibility of glare. The author noticed that in most of the simulations happened in all conditions and positions not only the DGP or DGI is responsible to measure the discomfort in a certain zone, because some results shows that the DGP is imperceptible but at the same time other results CVP or UGR or CGI are showing intolerable. It means the difference between the maximum illuminance and glare threshold is above 100% which means the maximum illuminance is extremely high than the glare threshold. The direct light and the maximum illuminance are high but it doesn't effect the employers in term of glare, but make a discomfort environment and that is due to the position which means, no possibility of glare. Going to the sunset we can notice the GDT is going high which means the illuminance penetrates to the observer is much high than the glare threshold, it doesn't mean direct light it means illuminance which can be indirect daylight but at the end no possibility of glare. The author noticed that also in P5 simulations not only the DGP or DGI is responsible to measure the discomfort in a certain zone, because some results shows that the DGP is imperceptible but at the same time other results CVP or UGR or CGI are showing intolerable.

Table 72: summary of GTD in the different time in sunny sky condition Jun 21, (S), (P5)

GTD in the different time in sunny sky condition Jun 21, (sh1), (E), (P5)				
TIME	T:7	T:9	T:12	T:15
GTD	314%	336%	346%	373%

- summary of GTD in the different time in sunny sky condition Jun 21, (S), (P6)

The table below shows the difference in the GDT between four times in the same day and position. The results demonstrate that at the morning and afternoon times have same probability for occurring glare is low and the results says that as most of the light is indirect. It means the maximum illuminance is extremally higher than the glare threshold which means, no possibility of discomfort glare, but still the other metrics shows that the discomfort environment is occur in all times in P6. Going to the sunset we can notice the GDT is still in the same range this because of the observer receives light same amount from sunrise until sunset. which means the illuminance penetrates to the observer is moderate, it doesn't mean direct light it means illuminance which can be indirect daylight but at the end no possibility of glare. The author noticed that in most of the simulations happened in all conditions and positions not only the DGP or DGI is responsible to measure the discomfort in a certain zone, because some results shows that the DGP is imperceptible but at the same time other results CVP or UGR or CGI are showing intolerable.

Table 73: summary of GTD in the different time in sunny sky condition Jun 21, (S), (P6)

GTD in the different time in sunny sky condition Jun 21, (S), (P6)				
TIME	T:7	T:9	T:12	T:15
GTD	457%	359%	327%	340%

4.3 Simulation in Jun 21 North orientation.

The author choses to do the simulation after rotating the building and keep the window opining facing the North direction. This orientation will keep the opining far away from the sun path same as shown in the figure below.

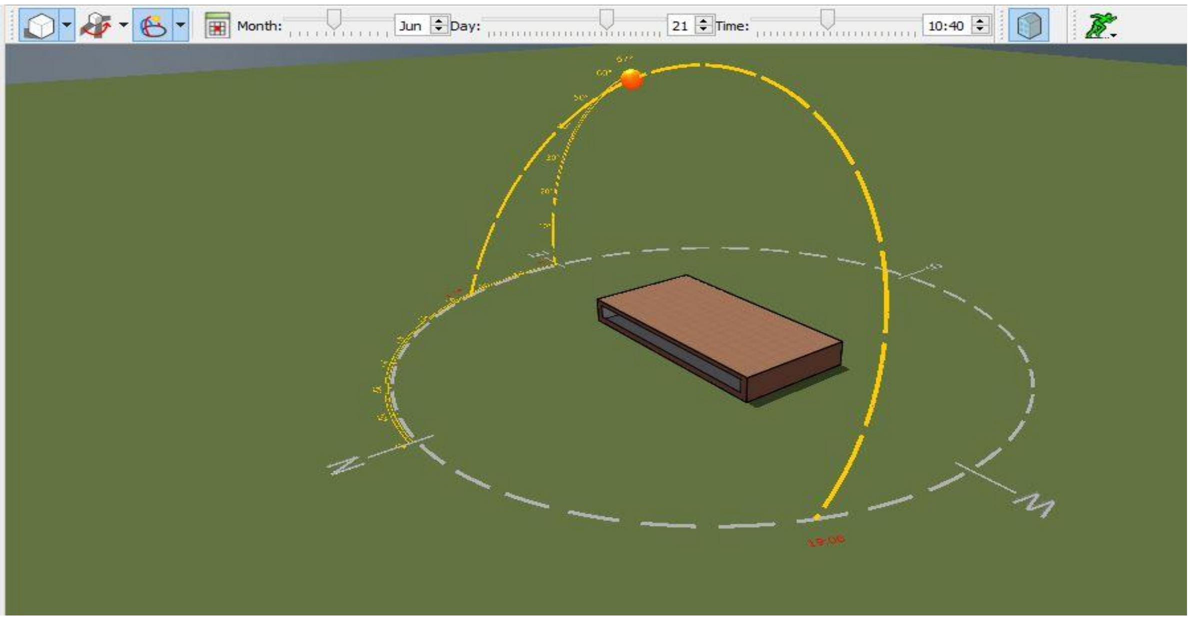


Figure 26: sun path while the widow directed to North direction.

There are main deferent sky conditions, but in this past the author decided to keep on doing the simulation in the sunny sky and after that will do the simulation using overcast sky.

4.3.1 Sky condition (Sunny sky),

In the simulation, the sky condition will set in the IESVE software as sunny sky. Time will set 7, 9,12 and 15, and the date will set 21 Jun, the orientation of the building will set the window toward North, after that the position is P4, P5 and P6.
The scale for the glare rating system in order to refer the results to the stander scale.

1- Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P4) and (T7).

In the approach of understanding the glare and analyse it. The author changes the direction of the window to (N). After that, the author keeps the position (P4) and the time is t=7. This all comes in the approach of figuring out the glare and understanding the luminance and sunlight behaviour and its impact on the employers in the office time as it is in the most of the offices in Dubai starts from 7 to 15. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as show in the table 74 below to get into the simulation results.

Table 74: Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P4) and (T7).

Glare rating	Maximum luminance =3119 cd/m² - Threshold 1786.71 cd/m²							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	25.51%	17.57					18.09	74%
perceptible			20.15					
disturbing				24.18		154.98		
intolerable					38.33			

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 25.51%, the glare is not disturbing the occupant's eye at all, also not causing any distraction. The other metrics is important, DGI reading is (17.57), which means it is fine to the zone's users and reached to the disturbing point. In addition, the UGR is perceptible (20.15) as per the standard scale. When check the result of CGI it is (24.18), which means it is disturbing as per the scale. GVCP the reading (38.33) shows intolerable result and this effect the occupant's comfort. The BRS (18.09) has a relation with DGI, which means the BRS is perceptible, and the GDGR (154.98) has a relation with CGI so that it is disturbing which has an impact on the zone's users. The threshold at that condition is 1786.71 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 3119 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(3119 - 1786.71)}{1786.71} \times 100 = 74\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes below 100%.

2- Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P4) and (T9).

In the approach of understanding the glare and analyse it. The author changes the direction of the window to (N). After that, the author keeps the position (P4) and the time is t=9. This all comes in the approach of figuring out the glare and understanding the luminance and sunlight behaviour and its impact on the employers in the office time as it is in the most of the offices in Dubai starts from 7 to 15. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as show in the table 75 below to get into the simulation results.

Table 75: Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P4) and (T9).

Glare rating	**Maximum luminance =1977 cd/m² - Threshold 1108.93 cd/m²**							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	27.07%							78%
perceptible		23.78					27.21	
disturbing								
intolerable			29.31	30.64	0.72	787.54		

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 27.07%, the glare is not disturbing the occupant's eye at all, also not causing any distraction. The other metrics is important, DGI reading is (23.78), which means it is fine to the zone's users and reached to the disturbing point. In addition, the UGR is intolerable (29.31) as per the standard scale. When check the result of CGI it is (30.64), which means it is intolerable as per the scale. GVCP the reading (0.72) shows intolerable result and this effect the occupant's comfort. The BRS (27.21) has a relation with DGI, which means the BRS is perceptible, and the GDGR (787.54) has a relation with CGI so that it is disturbing which has an impact on the zone's users. The threshold at that condition is 1108.93 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 1977 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(1977 - 1108.93)}{1108.93} \times 100 = 78\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes below 100%.

3- Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P4) and (T12).

In the approach of understanding the glare and analyse it. The author changes the direction of the window to (N). After that, the author keeps the position (P4) and the time is t=12. This all comes in the approach of figuring out the glare and understanding the luminance and sunlight behaviour and its impact on the employers in the office time as it is in the most of the offices in Dubai starts from 7 to 15. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as show in the table 76 below to get into the simulation results.

Table 76: Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P4) and (T12).

Glare rating	Maximum luminance =3536 cd/m² - Threshold 1887.62 cd/m²							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	31.19%							87%
perceptible								
disturbing		25.66					29.60	
intolerable			32.03	34.17	0.18	1116		

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 31.19%, the glare is not disturbing the occupant's eye at all, also not causing any distraction. The other metrics is important, DGI reading is (25.66), which means it is reached to the disturbing point. In addition, the UGR is intolerable (32.03) as per the standard scale. When check the result of CGI it is (34.17), which means it is intolerable as per the scale. GVCP the reading (0.18) shows intolerable result and this effect the occupant's comfort. The BRS (29.6) has a relation with DGI, which means the BRS is perceptible, and the GDGR (1116) has a relation with CGI so that it is disturbing which has an impact on the zone's users. The threshold at that condition is 1887.62 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 3536 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(3536 - 1887.62)}{1887.62} \times 100 = 87\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes blow 100%.

4- Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P4) and (T15).

In the approach of understanding the glare and analyse it. The author changes the direction of the window to (N). After that, the author keeps the position (P4) and the time is t=15. This all comes in the approach of figuring out the glare and understanding the luminance and sunlight behaviour and its impact on the employers in the office time as it is in the most of the offices in Dubai starts from 7 to 15. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as show in the table 77 below to get into the simulation results.

Table 77: Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P4) and (T15).

Glare rating	Maximum luminance =1910 cd/m² - Threshold 1030.25 cd/m²							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	26.91%							85%
perceptible								
disturbing		24					27.81	
intolerable			29.76	30.59	0.71	791		

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 26.91%, the glare is not disturbing the occupant’s eye at all, also not causing any distraction. The other metrics is important, DGI reading is (24), which means it is reached to the disturbing point. In addition, the UGR is intolerable (29.76) as per the standard scale. When check the result of CGI it is (30.59), which means it is intolerable as per the scale. GVCP the reading (0.71) shows intolerable result and this effect the occupant’s comfort. The BRS (27.81) has a relation with DGI, which means the BRS is perceptible, and the GDGR (791) has a relation with CGI so that it is disturbing which has an impact on the zone’s users. The threshold at that condition is 1030.25 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 1910 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(1910 - 1030.25)}{1030.25} \times 100 = 85\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes below 100%.

5- Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P5) and (T7).

In the approach of understanding the glare and analyse it. The author changes the direction of the window to (N). After that, the author keeps the position (P5) and the time is t=7. This all comes in the approach of figuring out the glare and understanding the luminance and sunlight behaviour and its impact on the employers in the office time as it is in the most of the offices in Dubai starts from 7 to 15. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as show in the table 78 below to get into the simulation results.

Table 78: Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P5) and (T7).

Glare rating	Maximum luminance =3090 cd/m² - Threshold 1241.25 cd/m²							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	23.04%							148%
perceptible		20.67					22	
disturbing			22.98	25.4		153.46		
intolerable					38.83			

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 23.04%, the glare is not disturbing the occupant's eye at all, also not causing any distraction. The other metrics is important, DGI reading is (20.67), which means it did not reach to the disturbing point. In addition, the UGR is intolerable (22.98) as per the standard scale. When check the result of CGI it is (25.4), which means it is intolerable as per the scale. GVCP the reading (38.83) shows intolerable result and this effect the occupant's comfort. The BRS (22) has a relation with DGI, which means the BRS is perceptible, and the GDGR (153.46) has a relation with CGI so that it is disturbing which has an impact on the zone's users. The threshold at that condition is 1241.25 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 3090 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(3090 - 1241.25)}{1241.25} \times 100 = 148\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes above 100%.

6- Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P5) and (T9).

In the approach of understanding the glare and analyse it. The author changes the direction of the window to (N). After that, the author keeps the position (P5) and the time is t=9. This all comes in the approach of figuring out the glare and understanding the luminance and sunlight behaviour and its impact on the employers in the office time as it is in the most of the offices in Dubai starts from 7 to 15. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as show in the table 79 below to get into the simulation results.

Table 79: Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P5) and (T9).

Glare rating	**Maximum luminance =2377 cd/m² - Threshold 655.3 cd/m²**							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	22.1%							262%
perceptible		21.44					23.98	
disturbing			24.37	25.07	30.63	181.61		
intolerable								

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 22.1%, the glare is not disturbing the occupant’s eye at all, also not causing any distraction. The other metrics is important, DGI reading is (21.44), which means it did not reach to the disturbing point. In addition, the UGR is disturbing (24.37) as per the standard scale. When check the result of CGI it is (25.07), which means it is disturbing as per the scale. GVCP the reading (30.63) shows disturbing result and this effect the occupant’s comfort. The BRS (23.98) has a relation with DGI, which means the BRS is perceptible, and the GDGR (181.61) has a relation with CGI so that it is disturbing which has an impact on the zone’s users. The threshold at that condition is 655.3 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 2377 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(2377 - 655.3)}{655.3} \times 100 = 262\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes above 100%.

7- Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P5) and (T12).

In the approach of understanding the glare and analyse it. The author changes the direction of the window to (N). After that, the author keeps the position (P5) and the time is t=12. This all comes in the approach of figuring out the glare and understanding the luminance and sunlight behaviour and its impact on the employers in the office time as it is in the most of the offices in Dubai starts from 7 to 15. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as show in the table 80 below to get into the simulation results.

Table 80: Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P5) and (T12).

Glare rating	**Maximum luminance =3486 cd/m² - Threshold 961.75 cd/m²**							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	23.59							262%
perceptible		22.46					25.05	
disturbing			25.75	26.91		219.46		
intolerable					22.46			

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 23.59%, the glare is not disturbing the occupant's eye at all, also not causing any distraction. The other metrics is important, DGI reading is (22.46), which means it did not reach to the disturbing point. In addition, the UGR is disturbing (25.75) as per the standard scale. When check the result of CGI it is (26.91), which means it is disturbing as per the scale. GVCP the reading (22.46) shows intolerable result and this effect the occupant's comfort. The BRS (25.05) has a relation with DGI, which means the BRS is perceptible, and the GDGR

(219.46) has a relation with CGI so that it is disturbing which has an impact on the zone's users. The threshold at that condition is 961.75 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 3486 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(3486 - 961.75)}{961.75} \times 100 = 262\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes above 100%.

8- Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P5) and (T15).

In the approach of understanding the glare and analyse it. The author changes the direction of the window to (N). After that, the author keeps the position (P5) and the time is t=15. This all comes in the approach of figuring out the glare and understanding the luminance and sunlight behaviour and its impact on the employers in the office time as it is in the most of the offices in Dubai starts from 7 to 15. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as show in the table 81 below to get into the simulation results.

Table 81: Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P5) and (T15).

	Maximum luminance =1770 cd/m² - Threshold 466.23 cd/m²							
Glare rating	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	19.47							279%
perceptible		20.56					23.06	
disturbing			23.19	23.64		154.97		
intolerable					38.33			

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 19.47%, the glare is not disturbing the occupant's eye at all, also not causing any distraction. The other metrics is important, DGI reading is (20.56), which means it did not reach to the disturbing point. In addition, the UGR is disturbing (23.19) as per the standard scale. When check the result of CGI it is (23.64), which means it is disturbing as per the scale. GVCP the reading (38.33) shows intolerable result and this effect the occupant's comfort. The BRS (23.06) has a relation with DGI, which means the BRS is perceptible, and the GDGR (154.97) has a relation with CGI so that it is disturbing which has an impact on the zone's users. The threshold at that condition is 466.23 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 1770 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(1770 - 466.23)}{466.23} \times 100 = 279\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes above 100%.

9- Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P6) and (T7).

In the approach of understanding the glare and analyse it. The author changes the direction of the window to (N). After that, the author keeps the position (P6) and the time is t=7. This all comes in the approach of figuring out the glare and understanding the luminance and sunlight behaviour and its impact on the employers in the office time as it is in the most of the offices in Dubai starts from 7 to 15. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as show in the table 82 below to get into the simulation results.

Table 82: Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P6) and (T7).

	Maximum luminance =1528 cd/m² - Threshold 458.28 cd/m²							
Glare rating	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	20.2%							233%
perceptible		19.64					21.46	
disturbing			22.21	23.51	40.25	149.24		
intolerable								

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 19.47%, the glare is not disturbing the occupant's eye at all, also not causing any distraction. The other metrics is important, DGI reading is (20.56), which means it did not reach to the disturbing point. In addition, the UGR is disturbing (23.19) as per the standard scale. When check the result of CGI it is (23.64), which means it is disturbing as per the scale. GVCP the reading (38.33) shows intolerable result and this effect the occupant's comfort. The BRS (23.06) has a relation with DGI, which means the BRS is perceptible, and the GDGR (154.97) has a relation with CGI so that it is disturbing which has an impact on the zone's users. The threshold at that condition is 466.23 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 1770 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(1770 - 466.23)}{466.23} \times 100 = 279\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes above 100%.

10- Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P6) and (T9).

In the approach of understanding the glare and analyse it. The author changes the direction of the window to (N). After that, the author keeps the position (P6) and the time is t=9. This all comes in the approach of figuring out the glare and understanding the luminance and sunlight behaviour and its impact on the employers in the office time as it is in the most of the offices in Dubai starts from 7 to 15. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as show in the table 83 below to get into the simulation results.

Table 83: Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P6) and (T9).

Glare rating	**Maximum luminance =1656 cd/m² - Threshold 464.32 cd/m²**							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	19.63%							233%
perceptible		20.30					22.54	
disturbing			22.74	23.42		154.53		
intolerable					38.48			

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible

19.63%, the glare is not disturbing the occupant's eye at all, also not causing any distraction. The other metrics is important, DGI reading is (20.30), which means it did not reach to the disturbing point. In addition, the UGR is disturbing (22.74) as per the standard scale. When check the result of CGI it is (23.42), which means it is disturbing as per the scale. GVCP the reading (38.48) shows intolerable result and this effect the occupant's comfort. The BRS (22.54) has a relation with DGI, which means the BRS is perceptible, and the GDGR (154.53) has a relation with CGI so that it is disturbing which has an impact on the zone's users. The threshold at that condition is 464.32 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 1656 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(1656 - 464.32)}{464.32} \times 100 = 233\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes above 100%.

11- Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P6) and (T12).

In the approach of understanding the glare and analyse it. The author changes the direction of the window to (N). After that, the author keeps the position (P6) and the time is t=12. This all comes in the approach of figuring out the glare and understanding the luminance and sunlight behaviour and its impact on the employers in the office time as it is in the most of the offices in Dubai starts from 7 to 15. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as show in the table 84 below to get into the simulation results.

Table 84: Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P6) and (T12).

Glare rating	Maximum luminance =3408 cd/m² - Threshold 921.52 cd/m²							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	23.42%							269%
perceptible		22.51					25.06	
disturbing			25.74	26.89		222		
intolerable					21.89			

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 23.42%, the glare is not disturbing the occupant's eye at all, also not causing any distraction. The other metrics is important, DGI reading is (22.51), which means it did not reach to the disturbing point. In addition, the UGR is disturbing (25.74) as per the standard scale. When check the result of CGI it is (26.89), which means it is disturbing as per the scale. GVCP the reading (21.89) shows intolerable result and this effect the occupant's comfort. The BRS (25.06) has a relation with DGI, which means the BRS is perceptible, and the GDGR (222) has a relation with CGI so that it is disturbing which has an impact on the zone's users. The threshold at that condition is 921.52 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 3408 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(3408 - 921.52)}{921.52} \times 100 = 269\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes above 100%.

12- Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P6) and (T15).

In the approach of understanding the glare and analyse it. The author changes the direction of the window to (N). After that, the author keeps the position (P6) and the time is t=15. This all comes in the approach of figuring out the glare and understanding the luminance and sunlight behaviour and its impact on the employers in the office time as it is in the most of the offices in Dubai starts from 7 to 15. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as show in the table 85 below to get into the simulation results.

Table 85: Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P6) and (T15).

Glare rating	Maximum luminance =2186 cd/m² - Threshold 571.12 cd/m²							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	21.65%							282%
perceptible		21.57					24.26	
disturbing			24.49	24.89		180.75		
intolerable					30.85			

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 21.65%, the glare is not disturbing the occupant's eye at all, also not causing any distraction. The other metrics is important, DGI reading is (21.57), which means it did not reach to the disturbing point. In addition, the UGR is disturbing (24.49) as per the standard scale. When check the result of CGI it is (24.89), which means it is disturbing as per the scale. GVCP the reading (30.85) shows intolerable result and this effect the occupant's comfort. The BRS (24.26) has a relation with DGI, which means the BRS is perceptible, and the GDGR (180.75) has a relation with CGI so that it is disturbing which has an impact on the zone's users. The threshold at that condition is 571.12 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 2186 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(2186 - 571.12)}{571.12} \times 100 = 282\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes above 100%.

The next stage is to add more positions in order to obtain more result and calculate the observer's reaction in term of glare and indoor visual discomfort.

- Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P4/1.5m) and (T8).

In the approach of understanding the glare and analyse it. The author changes the direction of the window to (E). After that, the author keeps the position (P4/1.5) which means the distance between the window and the observer position is 1.5m. The time is t=8. This all comes in the approach of figuring out the glare and understanding the luminance and sunlight behaviour and its impact on the employers in the office timing. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as show in the table 86 below to get into the simulation results.

Table 86: Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P4/1.5M) and (T8).

Glare rating	**Maximum luminance =440935200 cd/m² - Threshold 9736 cd/m²**							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible								
perceptible								
disturbing								
intolerable	100%	40.25	68.51	79.87	0.00	1796	63.64	4528815%

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 100%, the glare is intolerable it is causing discomfort and distraction as well as the rest of the other metrics results. The VCP is 0.00, from those tow metrics the author understand the situation of the current condition and position, it led to intolerable results and discomfort indoor environment The threshold at that condition is 9736 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 440935200 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(440935200 - 9736)}{9736} \times 100 = 4528815\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes above 100%. This result is extremally high because the sunlight directly penetrates to the observer's eye.

- Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P4/1.5m) and (T9).

In the approach of understanding the glare and analyse it. The author changes the direction of the window to (E). After that, the author keeps the position (P4/1.5) which means the distance between the window and the observer position is 1.5m. The time is t=9. This all comes in the approach of figuring out the glare and understanding the luminance and sunlight behaviour and its impact on the employers in the office timing. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as show in the table 87 below to get into the simulation results.

Table 87: Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P4/1.5M) and (T9).

Glare rating	Maximum luminance =409190777 cd/m² - Threshold 12013.47 cd/m²							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible								
perceptible								
disturbing								
intolerable	100%	36.41	64.59	15.67	0.00	8791	59.38	3406133%

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 100%, the glare is intolerable it is causing discomfort and distraction as well as the rest of the other metrics results. The VCP is 0.00, from those tow metrics the author understand the situation of the current condition and position, it led to intolerable results and discomfort indoor environment The threshold at that condition is 12013.47 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 409190777 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(409190777 - 12013.47)}{12013.47} \times 100 = 3406133\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes above 100%. This result is extremally high because the sunlight directly penetrates to the observer’s eye.

- Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P4/2m) and (T7).

In the approach of understanding the glare and analyse it. The author changes the direction of the window to (E). After that, the author keeps the position (P4/2m) which means the distance between the window and the observer position is 2m. The time is t=7. This all comes in the approach of figuring out the glare and understanding the luminance and sunlight behaviour and its impact on the employers in the office timing. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as show in the table 88 below to get into the simulation results.

Table 88: Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P4/2M) and (T7).

Glare rating	Maximum luminance =209309 cd/m² - Threshold 6438.81 cd/m²							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible								
perceptible								
disturbing								
intolerable	100%	33.87	46.13	55.72	0.00	5248	41.67	3150%

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes imperceptible 100%, the glare is intolerable it is causing discomfort and distraction as well as the rest of the other metrics results. The VCP is 0.00, from those tow metrics the author understand the situation of the current condition and position, it led to intolerable results and discomfort indoor environment The threshold at that condition is 6438.81 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 209309 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(209309\ - 6438.81\ )}{6438.81} \times 100 = 3150\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes above 100%. This result is extremally high because the sunlight directly penetrates to the observer’s eye.

- Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P4/2m) and (T8).

In the approach of understanding the glare and analyse it. The author changes the direction of the window to (E). After that, the author keeps the position (P4/2m) which means the distance between the window and the observer position is 2m. The time is t=8. This all comes in the approach of figuring out the glare and understanding the luminance and sunlight behaviour and its impact on the employers in the office timing. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as show in the table 89 below to get into the simulation results.

Table 89: Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P4/2M) and (T8).

Glare rating	Maximum luminance =449848741 cd/m² - Threshold 11095.66 cd/m²							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible								
perceptible								
disturbing								
intolerable	100%	39.69	67.41	78.59	0.00	5248	62.54	4054417%

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes intolerable 100%, the glare is intolerable it is causing discomfort and distraction as well as the rest of the other metrics results. The VCP is 0.00, from those tow metrics the author understand the situation of the current condition and position, it led to intolerable results and discomfort indoor environment The threshold at that condition is 11095.66 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 449848741 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(449848741 \ - 11095.66\ )}{11095.66} \times 100 = 4054417\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes above 100%. This result is extremally high because the sunlight directly penetrates to the observer’s eye.

- Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P4/2m) and (T9).

In the approach of understanding the glare and analyse it. The author changes the direction of the window to (E). After that, the author keeps the position (P4/2m) which means the distance between the window and the observer position is 2m. The time is t=9. This all comes in the approach of figuring out the glare and understanding the luminance and sunlight behaviour and its impact on the employers in the office timing. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as show in the table 90 below to get into the simulation results.

Table 90: Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P4/2M) and (T9).

Glare rating	Maximum luminance =5450 cd/m² - Threshold 14296.9 cd/m²							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	N/G	N/G	N/G	N/G	100	N/G	N/G	-61%
perceptible								
disturbing								
intolerable								

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes 0.00%, the glare source not coming to the observer's eye that's why it is 0.00. The VCP is 0.00, from those tow metrics the author understand the situation of the current condition and position, it led to imperceptible in the indoor environment The threshold at that condition is 11095.66 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 449848741 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(5450\ - 14296.9)}{14296.9} \times 100 = -61\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes extremally below 100%.

- Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P4/3m) and (T7).

In the approach of understanding the glare and analyse it. The author changes the position (P4/3m) which means the distance between the window and the observer position is 3m. The time is t=7. This all comes in the approach of figuring out the glare and understanding the luminance and sunlight behaviour and its impact on the employers in the office timing. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as show in the table 91 below to get into the simulation results.

Table 91: Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P4/3M) and (T7).

Glare rating	**Maximum luminance =413796307 cd/m² - Threshold 1119216 cd/m²**							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible								
perceptible								
disturbing								
intolerable	100%	43.12	70.99	81.06	0.00	3191	66.41	36871%

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes intolerable 100%, the glare is intolerable it is causing discomfort and distraction as well as the rest of the other metrics results. The VCP is 0.00, from those tow metrics the author understand the situation of the current condition and position, it led to intolerable results and discomfort indoor environment The threshold at that condition is 1119216 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 413796307 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(413796307 \ - 1119216 \ )}{1119216} \times 100 = 36871\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes above 100%. This result is extremally high because the sunlight directly penetrates to the observer’s eye.

- Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P4/3m) and (T8).

In the approach of understanding the glare and analyse it. The author changes the position (P4/3m) which means the distance between the window and the observer position is 3m. The time is t=8. This all comes in the approach of figuring out the glare and understanding the luminance and sunlight behaviour and its impact on the employers in the office timing. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as show in the table 92 below to get into the simulation results.

Table 92: Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P4/3M) and (T8).

Glare rating	Maximum luminance =7528 cd/m² - Threshold1 13974.05 cd/m²							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	N/G	N/G	N/G	N/G	100	N/G	N/G	-46%
perceptible								
disturbing								
intolerable								

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes 0.00%, the glare source not coming to the observer's eye that's why it is 0.00. The VCP is 0.00, from those tow metrics the author understand the situation of the current condition and position, it led to imperceptible in the indoor environment The threshold at that condition is 13974.05 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 7528 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(7528 \ - 13974.05)}{13974.05} \times 100 = -46\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes extremely below 100%.

- Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P4/3m) and (T9).

In the approach of understanding the glare and analyse it. The author changes the position (P4/3m) which means the distance between the window and the observer position is 3m. The time is t=9. This all comes in the approach of figuring out the glare and understanding the luminance and sunlight behaviour and its impact on the employers in the office timing. The simulation starts at this time to have the ability to calculate the glare either direct or reflected one. The author starts the process and the outcome as show in the table 93 below to get into the simulation results.

Table 93: Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P4/3M) and (T9).

Glare rating	Maximum luminance =4597 cd/m² - Threshold1 15502 cd/m²							
	DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
imperceptible	N/G	N/G	N/G	N/G	100	N/G	N/G	-70%
perceptible								
disturbing								
intolerable								

The results compared to the stander scale (refer table 9) to know what does the result mean. Above table demonstrates that at this condition and time the DGP comes 0.00%, the glare source not coming to the observer's eye that's why it is 0.00. The VCP is 0.00, from those tow metrics the author understand the situation of the current condition and position, it led to imperceptible in the indoor environment The threshold at that condition is 15502 cd/m², also the maximum luminance occur at the time of simulation under the condition mentioned before it is 4597 cd/m² and these two readings is important in the introduced metrics (GTD) to understand the comfort vision environment. In the finding point, the author will explain the relations with numbers at the end and show how he got this relation.

$$GTD = \frac{(4597\ - 15502)}{15502} \times 100 = -70\%$$

When implementing the new metric on the results, which has been introduced by the author, the result comes extremely below 100%.

Finding:

- . summary of northern orientation in the sunny sky conditions Jun21.

Results in north orientation is slightly same as than south orientation. The results of the simulation show that most of the disturbance illuminance and glare comes in the positions 5,6, even the sky condition is not giving the high level of light as the date is 21jun. The glare threshold differential (GTD) shows that even if there is no glare but the maximum luminance is high which allow the daylight to penetrate into the office without causing distraction or discomfort in term of glare. The higher GTD the better daylight penetrates into the room but with a possibility to occur a discomfort environment. On the other hand, the lower GTD the less daylight penetrates inside the office room with low discomfort environment

The below tables demonstrate the difference glare metrics results in different timing and orientation N, S and East.

The author neglected west orientation as it is slightly same as east orientation results but when change the time for example, east 7 am results same as west 3 pm result.

The simulations conducted in three positions P4, P5, and P6, the addition coms in change the position distance to the window which are 7m, 3m and 1.5m from the observer to the window opening and the tables below show that.

The work in Dec 21 is slightly different from jun21 as shown in tables 100, 101. It shows that in the lowest point of the sun in the sky in the entire year gives some disturbance compare to jun21 as in this day the highest point of the sun in the sky when fixing the conditions.

Table 94: summary of all simulations did in clear sky condition,7m positions, jun21.

N/G=no glare source			IMPERCEPTABLE		PERCEPTAPLE		DISTURBING		INTOLERABLE	
JUN21, CLEAR SKY,7m										
EAST ORIENTATION			DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
	T:9	P1	24.01%	19.6	23.36	23.99	41.98	144.3	21.8	150%
		P2	0	N/G	N/G	N/G	100	N/G	N/G	25%
		P3	20.69%	18.31	21.08	23.22	46.28	132.89	20.16	174%
		P4	26.50%	23.27	28.62	30.98	1.14	692.1	26.17	111%
		P5								
		P6								
	T:12	P1	24.41%	20.4	23.36	25.02	36.57	160.52	22.73	150%
		P2	0	N/G	N/G	N/G	100	N/G	N/G	-45%
		P3	22.12%	19.63	22.77	24.85	37.29	158.23	21.76	190%
		P4	28.07%	24.15	29.87	32.44	0.65	810.91	27.32	120%
		P5								
		P6								
	T:15	P1	16.54%	18.47	21.64	22.1	54	114.7	21.55	175%
		P2	0	N/G	N/G	N/G	100	N/G	N/G	-51%
		P3	12.59%	18.56	21.35	22.46	52.69	117.67	21.13	210%
		P4	24.58%	22.79	28.26	28.86	2.19	568.35	26.53	201%
		P5								
		P6								

Table 95: summary of all simulations did in intermediate sky with sun condition ,7m positions, jun21.

N/G=no glare source			IMPERCEPTABLE		PERCEPTAPLE		DISTURBING		INTOLERABLE	
JUN21, INTERMEDIATE SKY WITH SUN ,7m										
EAST ORIENTATION			DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
	T:9	P1								
		P2								
		P3								
		P4	29.31%	20.36	25.03	29.39	2.56	540.91	21.21	31%
		P5								
		P6								
	T:12	P1								
		P2								
		P3								
		P4	19.91%	19.57	23.47	23.63	8.74	345.49	22.24	54%
		P5								
		P6								
	T:15	P1								
		P2								
		P3								
		P4	22.91%	20.78	25.2	25.42	4.99	429.62	23.78	61%
		P5								
		P6								

Table 96: summary of all simulations did in overcast sky condition ,7m positions, jun21.

N/G=no glare source			IMPERCEPTABLE		PERCEPTAPLE		DISTURBING		INTOLERABLE	
JUN21, OVERCAST SKY ,7m										
			DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
SOUTH ORIENTATION	T:7	P1								
		P2								
		P3								
		P4	20.95%	19.39	23.13	23.83	8.91	342.64	22.03	76%
		P5	3.04%	16.17	17.47	18.2	70.91	81.66	18	251%
		P6	3.06%	16.16	17.49	18.21	70.64	82.15	18.02	248%
	T:9	P1								
		P2								
		P3								
		P4	24.49%	21.4	26.08	27.27	2.77	527.24	24.03	77%
		P5	15.37%	18.16	20.14	21.29	51.79	119.71	19.96	246%
		P6	15.22%	18.24	20.22	21.33	51.26	120.91	20.07	251%
	T:12	P1								
		P2								
		P3								
		P4	26.07%	22.31	27.29	29.38	1.5	639.11	24.95	77%
		P5	20.36%	19.09	21.36	22.75	42.79	142.07	20.9	250%
		P6	20.37%	19.14	21.43	22.79	42.37	143.23	20.98	250%
	T:15	P1								
		P2								
		P3								
		P4	25.04%	21.77	26.57	28.26	2.19	568.65	24.42	78%
		P5	17.64%	18.62	20.73	21.9	47.97	128.69	20.48	255%
		P6	17.88%	18.52	20.61	21.84	48.01	128.59	20.33	248%

Table 97: summary of all simulations did in sunny sky condition ,7m positions, jun21.

N/G=no glare source			IMPERCEPTABLE		PERCEPTAPLE		DISTURBING		INTOLERABLE	
JUN21, SUNNY SKY ,7m										
			DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
EAST ORIENTATION	T:7	P1								
		P2								
		P3								
		P4	0	N/G	N/G	N/G	100	N/G	N/G	-12%
		P5	30.65%	0	2.14	5.46	99.75	14.76	0	32.70%
		P6	38.98%	3.64	8.58	12.33	93.36	39.73	4.02	13.33%
	T:8	P1								
		P2								
		P3								
		P4	0	N/G	N/G	N/G	100	N/G	N/G	-16%
		P5								
		P6								
	T:9	P1								
		P2								
		P3								
		P4	39.97%	18.51	23.84	29.9	4.66	440.47	19.52	34%
		P5	27%	18.57	21.63	25.91	44.42	137.69	19.37	19%
		P6	25.71%	18.12	21.25	25.25	35.38	164.44	19.07	206.36
	T:12	P1								
		P2								
		P3								
		P4	31.08%	25.43	31.63	34.05	0.22	1071	29.11	76%

		P5	23.18%	21.49	24.41	26.27	25.17	205.37	23.52	269%
		P6	23.55%	22.13	25.36	26.56	24.11	210.67	24.65	324%
	T:15	P1								
		P2								
		P3								
		P4	26.32%	24.14	30.26	30.11	0.88	746.35	28.66	87%
		P5	15.82%	20.52	23.1	23.72	38.76	153.68	23.03	314%
		P6	16.87%	20.94	23.83	23.8	38.66	153.97	23.93	383%
NORTH ORIENTATION	T:7	P1								
		P2								
		P3								
		P4	25.51%	17.57	20.15	24.18	38.33	154.94	18.09	74%
		P5	23.04%	20.67	22.98	25.4	38.83	153.46	22	148%
		P6	20.20%	19.64	22.21	23.51	40.25	149.24	21.46	233%
	T:9	P1								
		P2								
		P3								
		P4	27.07%	23.78	29.31	30.64	0.72	787.54	27.2	78%
		P5	22.10%	21.44	24.37	25.07	30.63	181.61	23.98	262%
		P6	19.63%	20.3	22.74	23.42	38.48	154.53	22.54	233%
	T:12	P1								
		P2								
		P3								
		P4	31.19%	25.66	32.03	34.17	0.18	1116	29.6	87%
		P5	23.59%	22.46	25.75	26.91	22.46	219.46	25.05	262%
		P6	23.42%	22.51	25.74	26.89	21.89	222	25.06	269%
	T:15	P1								
		P2								
		P3								
		P4	26.91%	24	29.76	30.59	0.71	791	27.81	85%
		P5	19.47%	20.56	23.19	23.64	38.33	154.97	23.06	279%
		P6	21.65%	21.57	24.49	24.89	30.85	180.75	24.26	282%
SOUTH ORIENTATION	T:7	P1								
		P2								
		P3								
		P4	25.03%	22.87	28.86	28.1	1.93	591.56	27.52	197%
		P5	11.07%	20.37	23.04	22.6	44.59	137.26	23.45	336%
		P6	14.30%	20.82	23.65	23.17	40.99	147.09	23.99	457%
	T:9	P1								
		P2								
		P3								
		P4	26.01%	23.5	29.54	29.57	1.24	675.45	27.89	200%
		P5	17.34%	20.89	23.66	23.7	37.98	156.05	23.74	339%
		P6	20.40%	21.49	24.48	24.53	33.19	172	24.46	359%
	T:12	P1								
		P2								
		P3								
		P4	30.19%	25.11	31.24	33.43	0.31	982.34	29.17	117%
		P5	23.40%	22.49	25.77	26.78	22.74	217.89	25.17	346%
		P6	23.47%	22.54	25.86	26.91	22.11	221.42	25.23	327%
	T:15	P1								
		P2								
		P3								
		P4	26.13%	23.49	29.46	29.66	1.21	680.51	27.75	170%
		P5	20.28%	21.45	24.42	24.5	33.48	170.98	24.39	373%
		P6	17.87%	20.87	23.62	23.74	37.64	157.14	23.66	340%

Table 98: summary of all simulations did in sunny sky condition 1.5m positions, jun21.

N/G=no glare source	IMPERCEPTABLE	PERCEPTAPLE	DISTURBING	INTOLERABLE

JUN21, SUNNY SKY ,1.5m										
			DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
EAST ORIENTATION	T:7	P1								
		P2								
		P3								
		P4	100.00%	35.28	49.19	59.66	0	6830	44.51	6929.00%
		P5	28.08%	8.72	12.82	16.27	79.28	66.82	8.91	10.80%
		P6	33.23%	6.48	10.41	14.18	87.29	52.3	6.72	12.90%
	T:9	P1								
		P2								
		P3								
		P4	100.00%	36.02	64.59	75.9	0	8791	59.72	3406133.00%
		P5	49%	15.83	21.62	29.08	5.02	428.69	17.27	2.14%
		P6	0	N/G	N/G	N/G	100	N/G	N/G	-11.20%
	T:12	P1								
		P2								
		P3								
		P4	0	N/G	N/G	N/G	100	N/G	N/G	-41.00%
		P5	29.74%	15.41	20.12	25.04	13.78	282.4	16.33	20.50%
		P6	28.88%	19.41	21.29	26.09	33.97	169.27	19.75	42.90%
	T:15	P1								
		P2								
		P3								
		P4	0	N/G	N/G	N/G	100	N/G	N/G	-14.50%
		P5	23.53%	14.32	18.42	22.13	27.77	193.38	15.25	44.40%
		P6	23.26%	14.31	18.4	22.04	28.14	191.78	15.28	45.00%
NORTH ORIENTATION	T:7	P1								
		P2								
		P3								
		P4	100.00%	26.38	39.69	48.12	0.03	1705	35.44	6083.10%
		P5	100.00%	41.05	66.26	75.74	0	1654	61.79	17921.70%
		P6	22.69%	17.36	19.8	22.68	36.48	160.81	17.86	229.10%
	T:9	P1								
		P2								
		P3								
		P4	0	N/G	N/G	N/G	100	N/G	N/G	-35.40%
		P5	27.63%	20.08	21.91	26.33	33.04	172.54	20.58	17.90%
		P6	23.58%	13.91	17.79	21.53	42.41	143.12	14.73	33.20%
	T:12	P1								
		P2								
		P3								
		P4	0	N/G	N/G	N/G	100	N/G	N/G	-38.90%
		P5	29.62%	15.79	20.5	25.44	12.3	297.72	16.77	22.70%
		P6	29.26%	15.38	20.11	24.88	14.54	275.2	16.37	24%
	T:15	P1								
		P2								
		P3								
		P4	0	N/G	N/G	N/G	100	N/G	N/G	-32.00%
		P5	23.73%	14.01	18.1	21.86	30.39	182.55	14.86	41.10%
		P6	26.42%	19.04	20.81	25.07	38.99	152.98	19.47	23.10%
SO		P1								

	T:7	P2								
		P3								
		P4	0	N/G	N/G	N/G	100	N/G	N/G	-22.40%
		P5	21.72%	15.54	19.59	22.16	18.81	241.79	17.17	36.40%
		P6	23.30%	21.34	22.76	25.23	39.8	150.56	22.2	50.60%
	T:9	P1								
		P2								
		P3								
		P4	0	N/G	N/G	N/G	100	N/G	N/G	-33.00%
		P5	23.42%	14.58	18.66	22.32	24.97	206.35	15.56	38.20%
		P6	25.79%	20.34	21.88	25.79	34.72	166.67	20.85	25.80%
	T:12	P1								
		P2								
		P3								
		P4	0	N/G	N/G	N/G	100	N/G	N/G	-41.20%
		P5	29.35%	15.55	20.21	25.01	13.98	280.44	16.47	24.20%
		P6	29.65%	15.6	20.37	25.27	12.88	291.43	16.6	20.90%
	T:15	P1								
		P2								
		P3								
		P4	0	N/G	N/G	N/G	100	N/G	N/G	-28.30%
		P5	25.72%	17.65	20.51	24.6	31.67	177.59	18.35	28.06%
		P6	23.72%	14.36	18.5	22.23	27.51	194.56	15.29	42.70%

Table 99: summary of all simulations did in sunny sky condition 3m positions, jun21.

N/G= no glare source			IMPERCEPTABLE		PERCEPTAPLE		DISTURBING		INTOLERABLE	
JUN21, SUNNY SKY ,3m										
			DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
EAST ORIENTATION	T:7	P1								
		P2								
		P3								
		P4	100%	43.12	70.99	81.06	0	3191	66.41	36871%
		P5	29.44%	6.53	10.6	13.97	90	46.99	6.64	7.60%
		P6	100.00%	31.51	57.91	67.53	0	4192	53.29	506.20%
	T:9	P1								
		P2								
		P3								
		P4	0	N/G	N/G	N/G	100	N/G	N/G	-70%
		P5	46%	17.26	22.08	29.22	11.04	312.51	18.27	7.39%
		P6	0	N/G	N/G	N/G	100	N/G	N/G	-11.00%
	T:12	P1								
		P2								
		P3								
		P4	0	N/G	N/G	N/G	100	N/G	N/G	-35.10%
		P5	27.44%	19.16	22.19	26.67	33.65	170.37	20.03	27.60%
		P6	27.33%	19.18	22.21	26.63	31.29	179.03	20.07	30.80%
	T:15	P1								
		P2								
		P3								
		P4	28.91%	9.2	13.32	16.82	76.46	71.79	9.4	1.68%
		P5	22.36%	13.36	17.49	20.96	32.53	174.41	14.52	38.62%
		P6	22.46%	13.38	17.55	21.01	32.14	175.84	14.6	38.88%
NORTH ORIENTATION	T:7	P1								
		P2								
		P3								
		P4	33.69%	6.64	10.46	14.31	87.51	51.87	6.89	10%
		P5	32.02%	16.67	19.88	24.57	31.93	176.61	17.01	24.50%
		P6	21.67%	17.4	20.07	22.91	31.31	178.95	18.36	162.40%
	T:9	P1								
		P2								
		P3								
		P4	29.8%	N/G	N/G	N/G	100	N/G	N/G	-14.40%
		P5	24.87%	16.5	21.25	24.93	10.78	315.79	18.26	31.49%
		P6	22.47%	13.33	17.46	20.93	31.94	176.57	14.5	31.30%
	T:12	P1								
		P2								
		P3								
		P4	0	N/G	N/G	N/G	100	N/G	N/G	-34%
		P5	27.08%	16.2	21.2	25.59	9.61	331.94	17.9	25.30%
		P6	26.80%	19.86	22.3	26.59	29.98	184.17	20.58	44.70%
	T:15	P1								
		P2								
		P3								
		P4	0	N/G	N/G	N/G	100	N/G	N/G	-29.50%
		P5	22.46%	12.96	17.05	20.6	35.78	163.1	14	33.70%
		P6	24.08%	15.78	20.52	24.08	13.27	287.44	17.58	30.60%
SO UT	T:7	P1								
		P2								

		P3								
		P4	23.79%	3.95	6.77	10.18	96.22	32.32	4.16	9.50%
		P5	20.68%	15.08	19.5	21.36	22.73	217.95	17.41	45.61%
		P6	21.67%	16.37	21.26	23.07	15.33	268.25	19.13	56.11%
	T:9	P1								
		P2								
		P3								
		P4	0	N/G	N/G	N/G	100	N/G	N/G	-18.70%
		P5	22.29%	14.07	18.21	21.56	26.72	198.06	15.35	34.26%
		P6	23.60%	16.13	20.85	24.13	12.93	290.96	18.04	36.80%
	T:12	P1								
		P2								
		P3								
		P4	0	N/G	N/G	N/G	100	N/G	N/G	-27.80%
		P5	26.92%	19.43	21.94	26.35	26.07	201.08	20.13	34.44%
		P6	27.40%	19.39	22.52	26.91	28.33	190.99	20.33	32.00%
	T:15	P1								
		P2								
		P3								
		P4	0	N/G	N/G	N/G	100	N/G	N/G	-29.60%
		P5	23.65%	15.71	20.2	23.71	14.72	273.63	17.27	29.14%
		P6	22.56%	13.51	17.68	21.17	31.11	179.72	14.7	37%

Table 100: comparison of all simulations did in sunny sky condition, south orientation, T12 and different positions, JUN21.and DEC21.

D= DIMENTION			IMPERCEPTABLE		PERCEPTAPLE		DISTURBING		INTOLERABLE	
DEC21, SUNNY SKY, T:12										
SOUTH ORIENTATION			DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
	D:1.5m	P4	100%	44.37	71.63	83.33	0	3348	66.63	3071148%
		P5	0	N/G	N/G	N/G	100	N/G	N/G	-12.00%
		P6	0	N/G	N/G	N/G	100	N/G	N/G	-21.00%
	D:3m	P4	0	N/G	N/G	N/G	100	N/G	N/G	-58%
		P5	0	N/G	N/G	N/G	100	N/G	N/G	-5.00%
		P6	0	N/G	N/G	N/G	100	N/G	N/G	-20.00%
	D:7m	P4	47.25%	N/G	N/G	N/G	100	N/G	N/G	-35.90%
		P5	28.66%	17.4	20.56	25.11	48.48	127.45	17.99	104.40%
		P6	29.21%	17.59	20.58	25.23	45.58	134.68	18.14	94.00%
JUN21, SUNNY SKY, T:12										
SOUTH ORIENTATION			DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
	D:1.5m	P4	0	N/G	N/G	N/G	100	N/G	N/G	-27.80%
		P5	26.92%	19.43	21.94	26.35	26.07	201.08	20.13	34.44%
		P6	27.40%	19.39	22.52	26.91	28.33	190.99	20.33	32.00%
	D:3m	P4	0	N/G	N/G	N/G	100	N/G	N/G	-35.10%
		P5	27.44%	19.16	22.19	26.67	33.65	170.37	20.03	27.60%
		P6	27.33%	19.18	22.21	26.63	31.29	179.03	20.07	30.80%
	D:7m	P4	30.19%	25.11	31.24	33.43	0.31	982.34	29.17	117%
		P5	23.40%	22.49	25.77	26.78	22.74	217.89	25.17	346%
		P6	23.47%	22.54	25.86	26.91	22.11	221.42	25.23	327%

Table 101: comparison of all simulations did in sunny sky condition, south orientation, T9 and different positions, JUN21.and DEC21.

D= DIMENTION	IMPERCEPTABLE	PERCEPTAPLE	DISTURBING	INTOLERABLE

DEC21, SUNNY SKY, T:9										
SOUTH ORIENTATION			DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
	D:1.5m	P4	100%	32.7	49.07	59.18	0	6391	44.42	30848.00%
		P5	27.32%	18.42	20.78	24.99	32.61	174	18.76	91.00%
		P6	100.00%	37.47	62.33	72.97	0	1126	57.49	1727689.00%
	D:3m	P4	42.85%	N/G	N/G	N/G	100	N/G	N/G	-18.00%
		P5	27.00%	18.91	21.2	25.33	29.57	185	19.27	142.00%
		P6	0.00%	N/G	N/G	N/G	100	N/G	N/G	-44.00%
	D:7m	P4	40.10%	10.37	14.3	18.5	67.49	87.89	10.58	11.70%
		P5	23.50%	18.26	21.06	24.63	45.98	133.65	19.15	184%
		P6	29.97%	0	19.17	23.79	47.35	130	16.04	30%
JUN21, SUNNY SKY, T:9										
SOUTH ORIENTATION			DGP	DGI	UGR	CGI	GVCP	GDGR	BRS	GTD
	D:1.5m	P4	0	N/G	N/G	N/G	100	N/G	N/G	-33.00%
		P5	23.42%	14.58	18.66	22.32	24.97	206.35	15.56	38.20%
		P6	25.79%	20.34	21.88	25.79	34.72	166.67	20.85	25.80%
	D:3m	P4	0	N/G	N/G	N/G	100	N/G	N/G	-18.70%
		P5	22.29%	14.07	18.21	21.56	26.72	198.06	15.35	34.26%
		P6	23.60%	16.13	20.85	24.13	12.93	290.96	18.04	36.80%
	D:7m	P4	26.01%	23.5	29.54	29.57	1.24	675.45	27.89	200%
		P5	17.34%	20.89	23.66	23.7	37.98	156.05	23.74	339%
		P6	20.40%	21.49	24.48	24.53	33.19	172	24.46	359%

The summary tables demonstrate that the GTD works as a measurement that can predict the indoor discomfort environment, where the high reading means a discomfort environment. On the other hand, the low reading lead to comfort environment. In Dec21 simulation south direction gives more glare nor Jun21 at the same conditions specifically at T:9. When DGP reading is 100% the other metrics gives intolerable results also, yet it doesn't mean the DGP is the measurement of the discomfort in a certain zone are intolerable results.

The author noticed that also in simulations not only the DGP or DGI is responsible to measure the discomfort in a certain zone, because some results shows that the DGP is imperceptible but at the same time other results CVP or UGR or CGI are showing intolerable. All metrics give same results in specific conditions for example in table 97, in the E, P5 and at T:7 all metrics shows imperceptible result which means no discomfort visual environment at all, as well as in table 99 S ,P4 and at T:7 the metrics DGP, DGI, UGR, CGI, GDGR, GVCP and BRS is imperceptible. The important factors that combined to give same results in the metrics is the building orientation, observer position, and timing. Indeed, the sky condition is not a main factor as the sunny sky condition is the only condition that most of the discomfort occur in it that's why all experts kept it as responsible, also the author noticed that after many simulations in different sky condition same results of sky condition. Moving back to the factors, the building orientation is principle, when opining facing the East the building is exposed directly to the daylight in the sunrise timing, the determine for the comfort or discomfort in this place is the observer position, for example in different results in same condition but changing the position like P4 7m, P4 3m and P4 1.5m. in p4 7m all metrics is imperceptible. On the other hand, in P4 1.5m results are intolerable, as well as in P4 3m. The conditions that all metrics agree with intolerable are many in the results such as, table 101 P4 and P6 in D:1.5, also in table 100 P4 in D:1.5. Moreover, in table 98 the E, T:7 and P4, also E, T9 and P4, additionally the N, T:7 and P5.

Comparing the result in this research with Marc Schiler and Karen Kensek,2016, research will find that they came up with DGP is giving the best results in term of glare assessment, while in this research the DGP is not the one who responsible for the glare discomfort assessment. VCP and CGI show marginally higher precision rates than DGI and UGR yet they are not equipped for breaking down glare scenes with direct daylight, this is the opposite of what they came up with while they found that DGI and UGR show marginally higher precision rates than VCP and CGI yet they are not equipped for breaking down glare scenes with direct daylight.

Chapter5: Conclusions and Recommendations

We investigated the outcomes of different daylight glare metric using an open plan office with a side window. Different observer locations and viewing direction were used. Radiance software was the tool for this simulation. The location is Dubai and we used sunny sky, overcast sky, and intermediate sky with sun. We found out the following conclusions:

- Different glare metrics do not agree on the conclusions of the daylight glare. For example, when DGP indicates an imperceptible glare, other metrics such as VCP indicates intolerable. This situation occurred for example in sunny sky at noon for east orientation for a point that is 3 meters away from the window in both P5 and P6. UGR, CGI, and GDR agreed showed that the glare is disturbing GVCP on the other hand showed the glare to be intolerable. DGI classified the glare as perceptible whereas, DGP showed the glare as Imperceptible.
- For most of the time, DGP measure an imperceptible glare. The only situations that DGP results in intolerable was in P4 and P6, 3 meters away from the window, at 7AM and P5 at 9 am. Similarly, intolerable glare was measured by DGP in points that are 1.5 m away at 7AM and 9AM east orientation. In north orientation at 7 am June 21st, DGP indicated intolerable glare.
- All metrics agreed on daylight glare to be intolerable in the following conditions:
    - June 21st, sunny sky, east orientation the point is 3m away from the window at 7AM in P4, and P6
    - June 21st, sunny sky, east orientation, the point is 1.5m away from the window at 7AM in P4. Similarly, on the north orientation but P5.
    - The metrics almost agreed with most of them showing intolerable or disturbing at 7AM, P4, sunny sky on June 21st 1.5 meter away from the window.
    - On December 21st, sunny sky, south orientation, at 9AM, P4 and P6, 1.5 meter away. At Noon time, P4 also had agreement between all metrics.

  All of the above conditions have direct sun penetrating the space.

- All metrics agreed on glare to be imperceptible in the following conditions
    - June 21st, sunny sky, east orientation, at 7AM, for point 5 that is 7 meters away from the window.

- June 21st, sunny sky, south orientation, at 7AM, for point 4 that is 3 meters away from the window.

- DGP only indicated glare in situations where the observer is under direct sun. Otherwise, it showed imperceptible glare.
- Most of the time UGR and CGI agreed on the outcome of glare evaluations. One exemption is June 21st sunny sky, east orientation, 9AM, for point 5 that is 1.5 meter away.
- BRS and DGI agreed in all conditions because the two metrics are related to each other.
- GDGR and CGI also agreed in all conditions.
- When the direct sunlight is not where the observer is, the daylight glare is imperceptible by DGP metric.
- Metrics other than DGP and DGI, accounts for internally reflected sunlight. An example of this is when the sun actually penetrates the space but is not directly on the observer location such as when the observer is 7 meters away from the window. We found in this case that BOTH DGP and DGI show predominately imperceptible glare, whereas other metrics show perceptible, disturbing and even in some cases intolerable.
- We note that DGP was developed for viewing direction parallel to the window and it is not valid for P4 when the viewing direction is actually perpendicular to the window.
- In almost all conditions, P4 which is facing the window, results in more glare than other points.
- CGI is rarely imperceptible. We found it to be imperceptible only when all other metrics indicate imperceptible glare.
- GVCP is also rarely imperceptible except when there is no direct sunlight onto the observer eyes and when all other metrics agreed on have imperceptible glare.
- GDGR is also rarely imperceptible except when all other metrics agree.
- We have developed on a new glare metric based on the glare threshold that Radiance produces. The new metric is terms glare threshold differential and it measures the difference between the threshold and the maximum luminance within the scene in

percent. A negative or zero value indicates no glare. If the value is large then it indicates glare. We propose the following scale for the glare threshold differential.

Table 102: introduced metric (GTD) scale

SUBJECTIVE RATING	GTD RANGE
Imperceptible	less than 20%
Perceptible	20% – 40%
Disturbing	40% – 80%
Intolerable	greater than 80%

- This scale produced from the outcomes from the simulations in this work.
- It is clear that there needs to be consensus about which glare metric is best to use. A rigors human factor experiment with subject would be useful in establishing a correlation between all metrics with the perception of glare.
- The future work hope to involve more details such as add shading devices, blinds and furniture.
- Modeling oriented investigation of the main conclusion of this study in term of develop basic daylight discomfort guidelines.
- The new metric can be used in future studies as an indicator of daylight glare.
- Also, to investigating the interaction between glare and discomfort glare.
- Human factors experiment with subjects.
- To establish a correlation between all metrics with perception of glare.

References

Andersen, M. et al. (2008). Informing daylighting design with the Lightsolve approach: Why and how. *PLEA 2008 - Towards Zero Energy Building: 25th PLEA International Conference on Passive and Low Energy Architecture, Conference Proceedings*, (October).

Bellia, L. et al. (2008). Daylight glare: a review of discomfort indexes. *Detec*. [online]. Available from: http://www.fedoa.unina.it/1312/1/Bellia_paper.pdf.

Carlucci, S. et al. (2015). A review of indices for assessing visual comfort with a view to their use in optimization processes to support building integrated design.

International, S. and Edition, E. *ARCHITECTS ' DATA*.

Jakubiec, A. and Reinhart, C. (2010). The use of glare metrics in the design of daylit spaces: recommendations for practice. *9th international Radiance workshop, Harvard Design …*. [online]. Available from: http://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:The+Use+of+Glare+Metrics+in+the+Design+of+Daylit+Spaces+:+Recommendations+for+Practice#0.

Jakubiec, J.A. and Reinhart, C.F. (2016). A Concept for Predicting Occupants' Long-Term Visual Comfort within Daylit Spaces. *LEUKOS - Journal of Illuminating Engineering Society of North America*, 12(4), pp.185–202.

Mardaljevic, J., Heschong, L. and Lee, E. (2009). Daylight metrics and energy savings. *Lighting Research and Technology*, 41(3), pp.261–283.

Mcneil, A. and Burrell, G. (2016a). Applicability of DGP and DGI for evaluating glare in a brightly daylit space. *SimBuild*, pp.57–64.

Mcneil, A. and Burrell, G. (2016b). APPLICABILITY OF DGP AND DGI FOR EVALUATING GLARE IN A BRIGHTLY DAYLIT SPACE Independant Consultant , Oakland , CA Arup , San Francisco , CA. *SimBuild*, pp.57–64.

Pierson, C., Wienold, J. and Bodart, M. (2018). Review of Factors Influencing Discomfort Glare Perception from Daylight. *LEUKOS - Journal of Illuminating Engineering Society of North America*, 14(3), pp.111–148. [online]. Available from: https://doi.org/10.1080/15502724.2018.1428617.

Schiler, M. (2009). Examples of glare remediation techniques: Four buildings. *PLEA 2009 - Architecture Energy and the Occupant's Perspective: Proceedings of the 26th International Conference on Passive and Low Energy Architecture*, (June), pp.22–24.

Suk, J.Y., Schiler, M. and Kensek, K. (2016). Investigating their accuracy and consistency in daylight glare evaluation by using human subject study data. , (October), pp.3–11.

Thaloob. (2017). Developing Dynamic Daylighting Metric for Dynamic Facades in Office Buildings in Dubai In Partial Fulfillment of the Requirements for the Degree of MS . c.

Tuaycharoen, N. (2006). The Reduction of Discomfort Glare from Windows by Interesting Views [PhD Thesis]. , (June).

Wienold, J. et al. (2008). Evaluation methods and development of a new glare prediction model for daylight environments with the use of CCD cameras. *Detec*, 48(June), pp.1576–1585. [online]. Available from: https://doi.org/10.1016/j.egypro.2017.07.332.

Wienold, J. and Christoffersen, J. (2006). Evaluation methods and development of a new glare prediction model for daylight environments with the use of CCD cameras. *Energy and Buildings*, 38(7), pp.743–757.

Anon (2000). *The IESNA Lighting Handbook: Reference & Application. New York: Illuminating Engineering Society of North America.Harrold, R., D. Mennie, and IESNA, IESNA Lighting Ready Reference: A Compendium of Materials from the IESNA Lighting Handbook 9th ed. Lighting Fundamentals. 2003: Illuminating Engineering Society of North America.*

MacGowan, D. and Clear, R. (2013). *Correspondence: Discomfort glare. Lighting Research & Technology, 45(2), pp.258-260.*

CIE/IEC, International Lighting Vocabulary, in CIE/IEC 17.4 1987, *International Commission on Illumination and International Electrotechnical Commission.*

Badawieh, S. (2017). *The Impact of Internal Dynamic Facades on Energy Saving. MS.c in Sustainable Built Environment. MSc in Sustainable Built Environment. British University in Dubai.*

Vbn.aau.dk. (2019). *[online] Available at: http://vbn.aau.dk/ws/files/39949211/Intelligent_Glazed_Facades_for_Fulfilment_of_Future_Energy_Regulations.pdf* [Accessed 30 Oct. 2019].

Wymelenberg, K. & Mahić, A. (2016). *"Annual Daylighting Performance Metrics, Explained".*

DAYLIGHTING METRICS—Defining Successful Daylighting. (2008). *1st edn. United States:enlighten.* Viewed 4 June 2019.

Anon, (2019). *[online] Available at: https://www.seventhwave.org/sites/default/files/enlighten_Aug08.pdf.* [Accessed 30 Oct. 2019].

Data, A. (2019). *Architectural Standard - Ernst & Peter Neufert - Architects' Data : Free Download, Borrow, and Streaming : Internet Archive. [online] Internet Archive. Available at: https://archive.org/details/Architectural_Standard_Ernst_Peter_Neufert_Architects_Data/page/n7*. [Accessed 30 Oct. 2019].

Johnsen, K. & Winther, F. (2015). *Dynamic Facades, the Smart Way of Meeting the Energy Requirements. Energy Procedia, vol. 78, pp. 1568-1573.*

Mardaljevic, J., Heschong, L. & Lee, E. (2009). *Daylight metrics and energy savings. Lighting Research + Technology.* Viewed 4 June 2019.

Buildings.lbl.gov. (2019*). [online] Available at: https://buildings.lbl.gov/sites/all/files/lbnl-4585e.pdf [Accessed 30 Oct. 2019]*.

Energy.gov. (2019*). [online] Available at: https://energy.gov/sites/prod/files/2016/06/f32/qs_IES_Virtual_Environment_2015.pdf* [Accessed 30 Oct. 2019].

https://energy.gov/sites/prod/files/2016/06/f32/qs_IES_Virtual_Environment_2015.pdf

<VE> MODULE TUTORIAL. (n.d.). Integrated Environmental Solutions (IES). Viewed 3 August 2019. https://www.iesve.com/software/ve-pro/tutorial-files/ies_ve_tutorial.pdf

"Weather and temperature averages for dubai, Dubai". (2017). [Accessed 1 July 2019]. Available.

Wienold, Jan and Christoffersen, Jens. “Evaluation methods and development of a new glare prediction model for daylight environments with the use of CCD cameras.” Energy and Buildings (2006); Volume 38, Issue 7.

Hopkinson RG. Glare from windows. Construction Research and Development Journal 1971; 2: 98-105.

Hopkinson RG. Glare from daylighting in buildings. Applied Ergonomics 1972;3:206-15.

Mardaljevic, J., Heschong, L. & Lee, E. (2009). *Daylight metrics and energy savings. Lighting Research + Technology. Viewed 4 June 2019.*

Anon, (2019*). [online] Available at: https://buildings.lbl.gov/sites/all/files/lbnl-4585e.pdf. [Accessed 30 Oct. 2019]*.

Y.-C. Chan, A. Tzempelikos, Eff. venetian blind control strat. considering daylight util.

and glare protection, Solar Energy, 98 (2013) 241-254.

C.M. Bourassa, J.D. Wirtschafter, Mechanism of binocular increase of discomfort to high luminance, Nature, 212 (1966) 1503–1504.

M.G. Kent et al., Temporal variables and personal factors in glare sensation, Lighting Research Technology, 0 (2015) 1-22.

New-learn.info. (2019). *UGR. [online] Available at: https://www.new-learn.info/packages/clear/visual/people/performance/glare/glare_ugr.html [Accessed 30 Oct. 2019]*.

https://core.ac.uk/download/pdf/77023050.pdf

Lechner, N. (2015). *Heating, cooling, lighting. 4th ed. New Jersey: John Wiley & Sons, p.399-450.*

Anon, (2019). *[online] Available at: https://www.researchgate.net/publication/313608753_Towards_a_new_daylight_glare_rating.* [Accessed 30 Oct. 2019].

Archlighting.com. (2019). *[online] Available at: http://www.archlighting.com/technology/annual-daylighting-performance-metrics-explained_o.* [Accessed 30 Oct. 2019].

Anon, (2019). *[online] Available at: https://www.researchgate.net/publication/222908061_Evaluation_methods_and_development_of_a_new_glare_prediction_model_for_daylight_environments_with_the_use_of_CCD_cameras*. [Accessed 30 Oct. 2019].

McNeil, A. and Burrell, G. (2019*). APPLICABILITY OF DGP AND DGI FOR EVALUATING GLARE IN A BRIGHTLY DAYLIT SPACE. [online] Ibpsa-usa.org. Available at: http://ibpsa-usa.org/index.php/ibpusa/article/view/339/328.* [Accessed 30 Oct. 2019].

Anon, (2019). *[online] Available at: http://www.fedoa.unina.it/1312/1/Bellia_ (Bellia, 2008)paper.pdf* [Accessed 30 Oct. 2019].

epdf.pub. (2019). *IESNA Lighting Handbook - PDF Free Download. [online] Available at: https://epdf.pub/iesna-lighting-handbook.html* [Accessed 30 Oct. 2019].

IES, Approved Method: IES Spatial Daylight Autonomy (sDA) and Annual Sunlight Exposure (ASE). 2012, Illuminating Engineering Society.

IESNA, The lighting handbook. ninth ed. ed. 2000, New York (USA): Illuminating Engineering Society of North America.

Meyer, J.J., et al., Visual discomfort: Evaluation after introducing modulated light equipment, in Right Light, 2nd European Conference on Energy-Efficient Lighting. 1993: Arnhem (NL). p. 348-357.

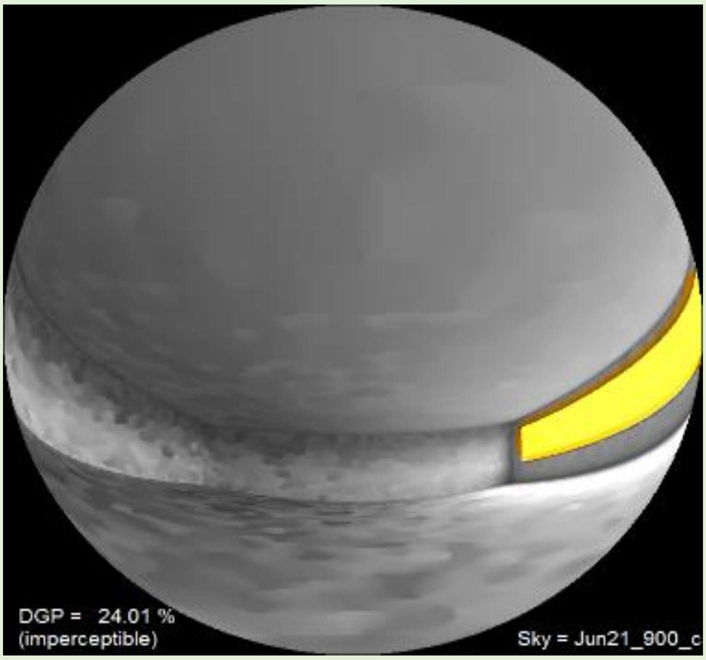
Stearns, E. (1988). *Commission Internationale de L'Éclairage, Colorimetry, 2nd ed., Publication CIE No. 15.2, 78 + vi pp., paperbound, price $28; Central Bureau of the CIE, Vienna, 1987. Available in the U.S. from the U.S. National Committee, CIE, c/o National Bureau of Standards, Gaithersburg, Maryland 20899. Special price to USNC members of $22.00. Color Research & Application, 13(1), pp.64-65.*

APPENDIXES

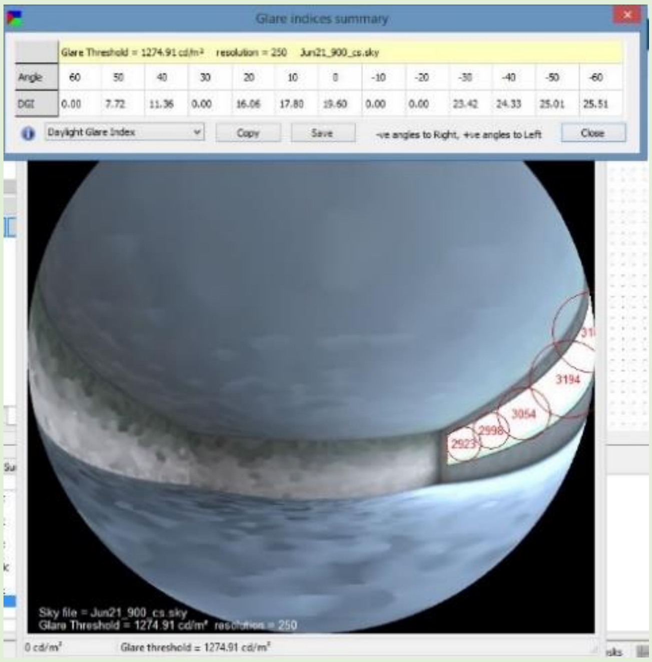
Table 103: Daylight and Glare Analysis for Jun 21, with clear sky, (E), (P1),(T9).

Daylight and Glare Analysis for Jun 21, (clear sky), (E), (P1) (T9).

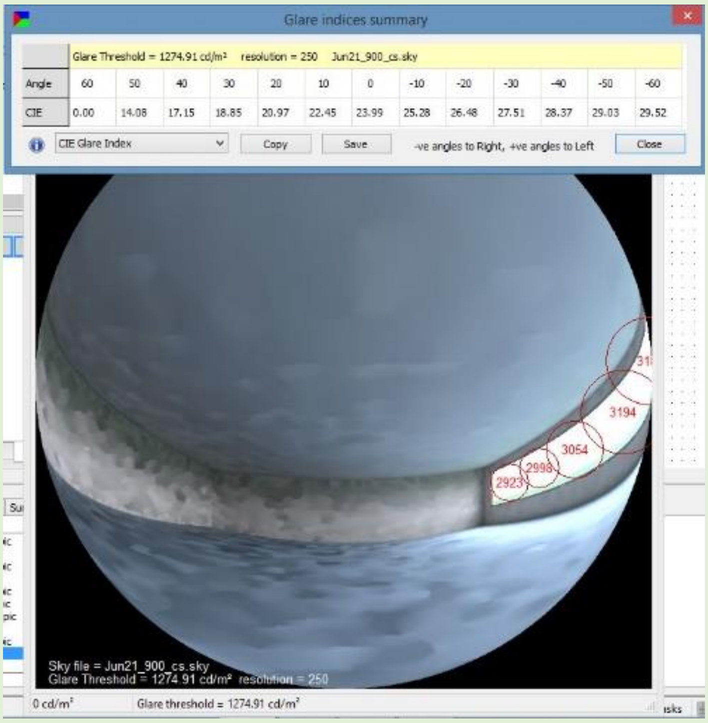
DGP



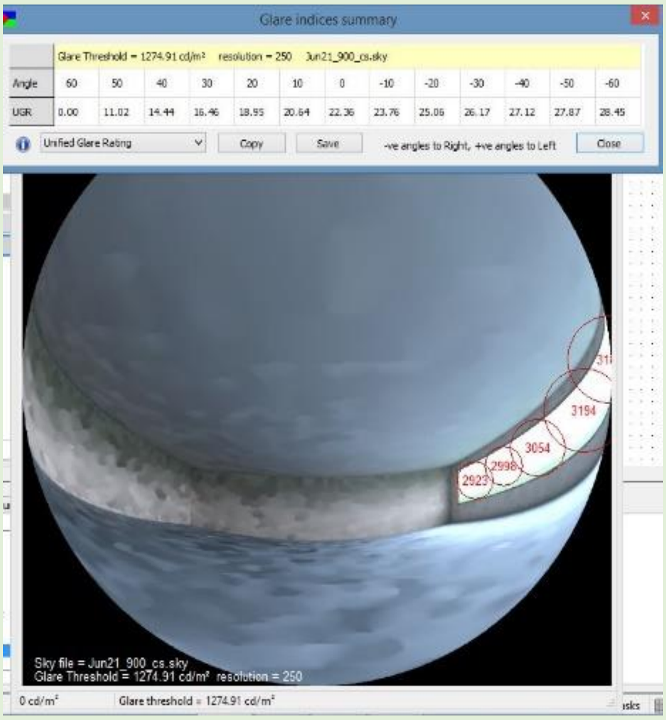
DGI

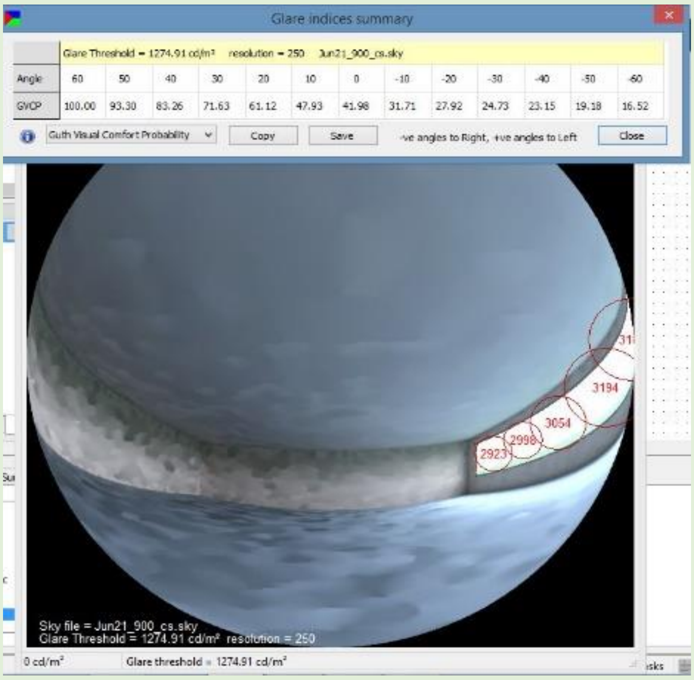
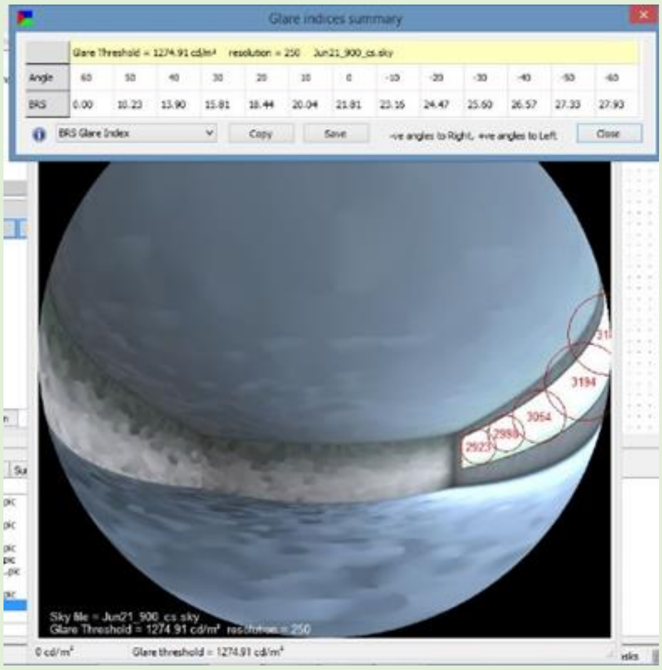


CGI



UGR

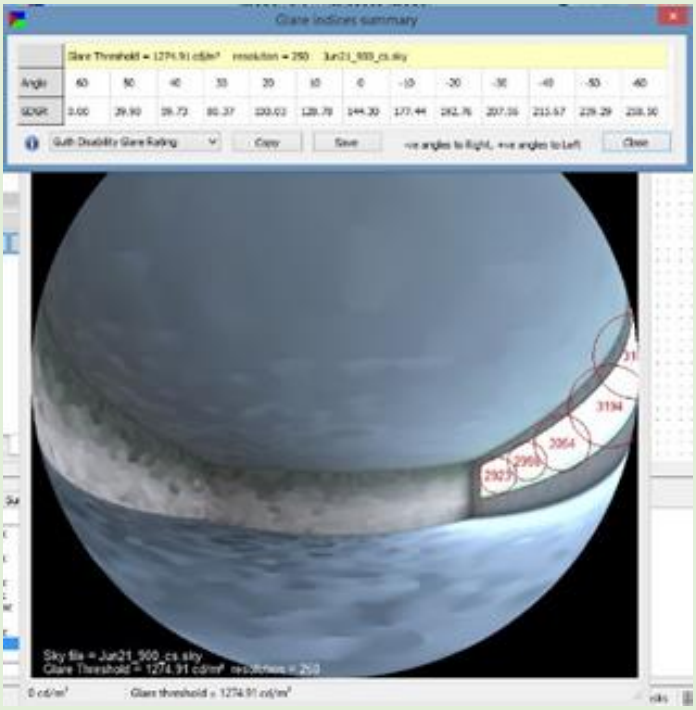


VCP	BRS
	

Glare indices summary
Glare Threshold = 1274.91 cd/m² resolution = 250 Jun21_900_cs.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 100.00 93.30 83.26 71.63 61.12 47.93 41.98 31.71 27.92 24.73 23.15 19.18 16.52
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3194
3054
2998
2923
Sky file = Jun21_900_cs.sky
Glare Threshold = 1274.91 cd/m² resolution = 250
0 cd/m²
Glare threshold = 1274.91 cd/m²

Glare indices summary
Glare Threshold = 1274.91 cd/m² resolution = 250 Jun21_900_cs.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 0.00 10.23 13.90 15.81 18.44 20.04 21.81 23.16 24.47 25.60 26.57 27.33 27.93
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3194
3054
2998
2923
Sky file = Jun21_900_cs.sky
Glare Threshold = 1274.91 cd/m² resolution = 250
0 cd/m²
Glare threshold = 1274.91 cd/m²

GDGR

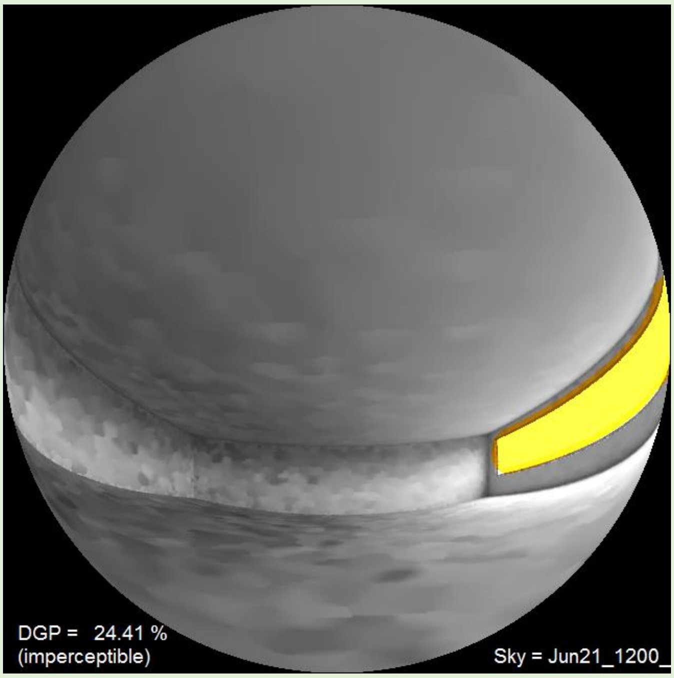


Glare indices summary
Guth Disability Glare Rating
Copy
Save
Close
3194
3054
2998
2923

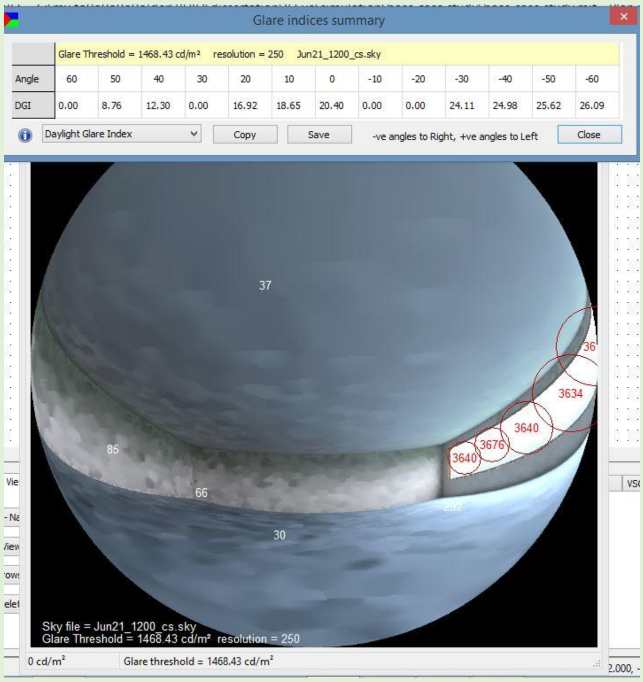
Table 104: Daylight and Glare Analysis for Jun 21, with clear sky, (E), (P1),(T12).

Daylight and Glare Analysis for Jun 21, (clear sky), (E), (P1) (T12).

DGP

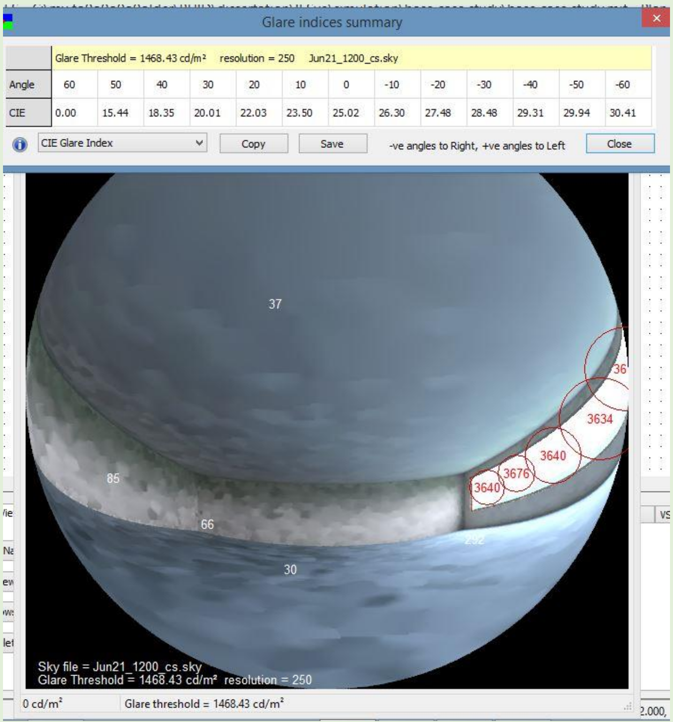


DGI



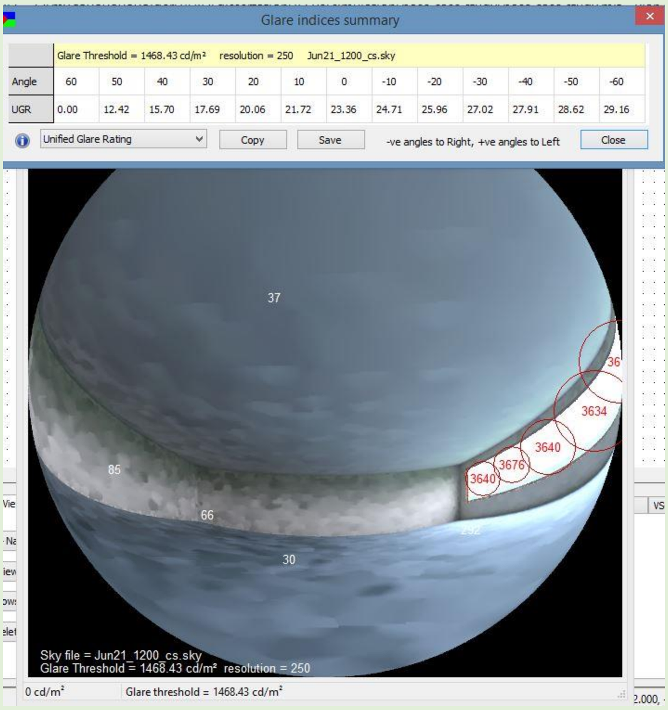
Glare Threshold = 1468.43 cd/m² resolution = 250 Jun21_1200_cs.sky													
Angle	60	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
DGI	0.00	8.76	12.30	0.00	16.92	18.65	20.40	0.00	0.00	24.11	24.98	25.62	26.09

CGI



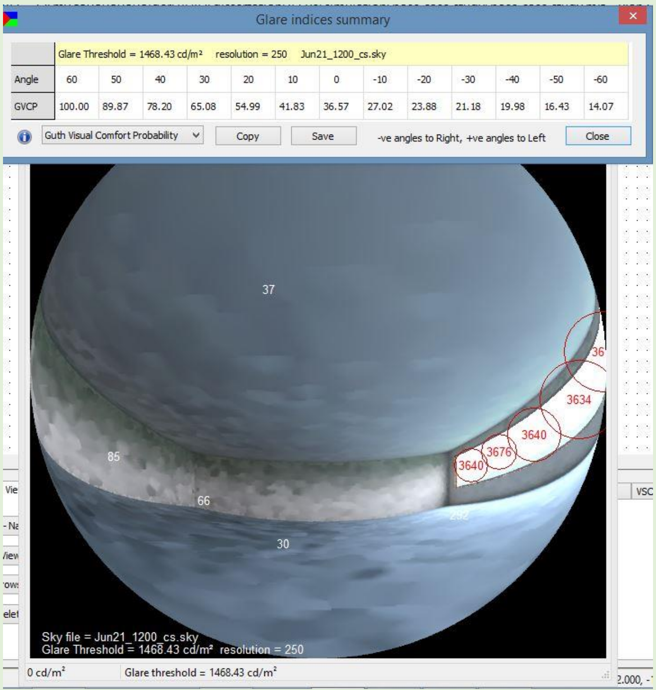
Glare Threshold = 1468.43 cd/m² resolution = 250 Jun21_1200_cs.sky													
Angle	60	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
CIE	0.00	15.44	18.35	20.01	22.03	23.50	25.02	26.30	27.48	28.48	29.31	29.94	30.41

UGR



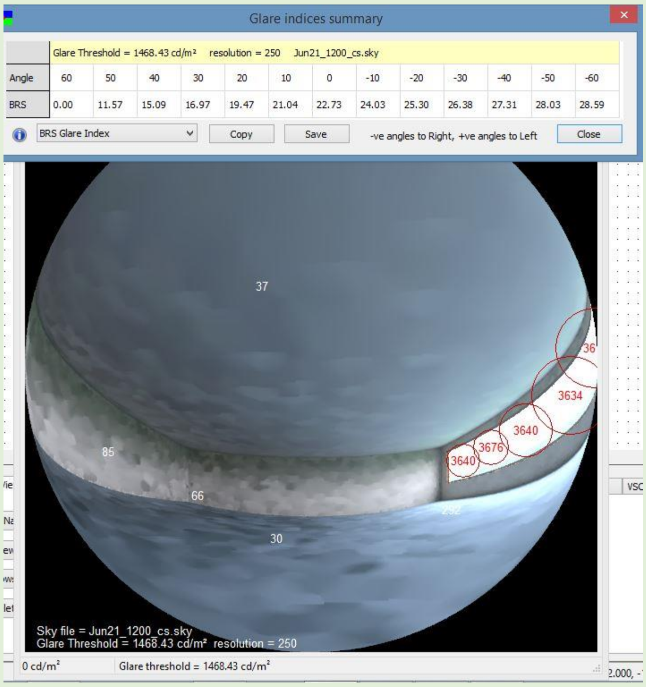
Glare Threshold = 1468.43 cd/m² resolution = 250 Jun21_1200_cs.sky													
Angle	60	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
UGR	0.00	12.42	15.70	17.69	20.06	21.72	23.36	24.71	25.96	27.02	27.91	28.62	29.16

VCP



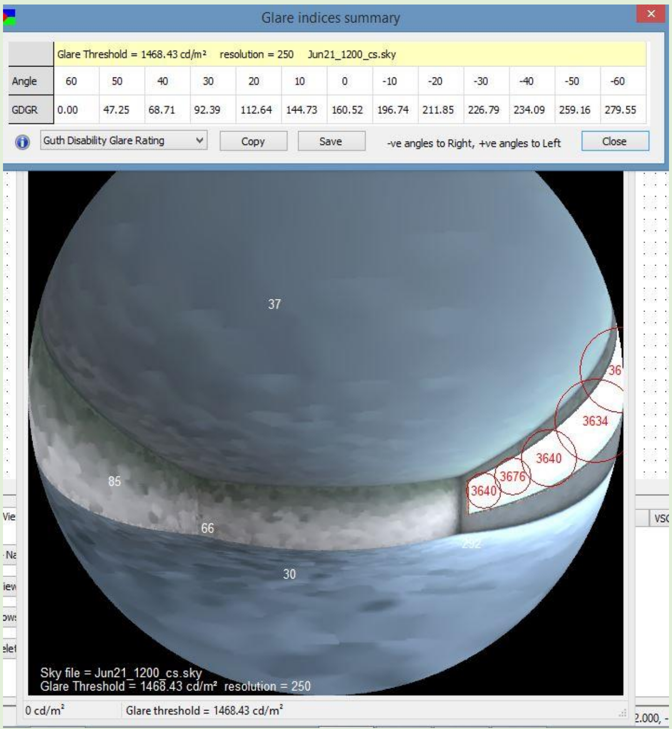
Angle	60	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
GVCP	100.00	89.87	78.20	65.08	54.99	41.83	36.57	27.02	23.88	21.18	19.98	16.43	14.07

BRS



Angle	60	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
BRS	0.00	11.57	15.09	16.97	19.47	21.04	22.73	24.03	25.30	26.38	27.31	28.03	28.59

GDGR

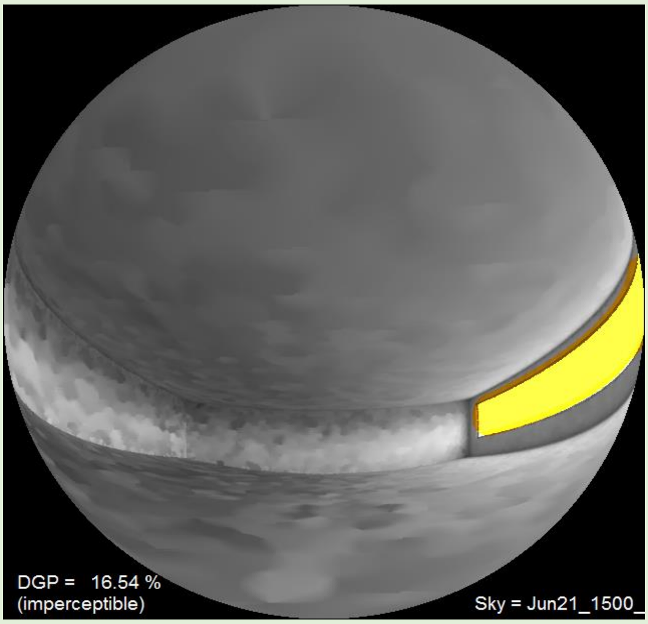


Angle	60	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
GDGR	0.00	47.25	68.71	92.39	112.64	144.73	160.52	196.74	211.85	226.79	234.09	259.16	279.55

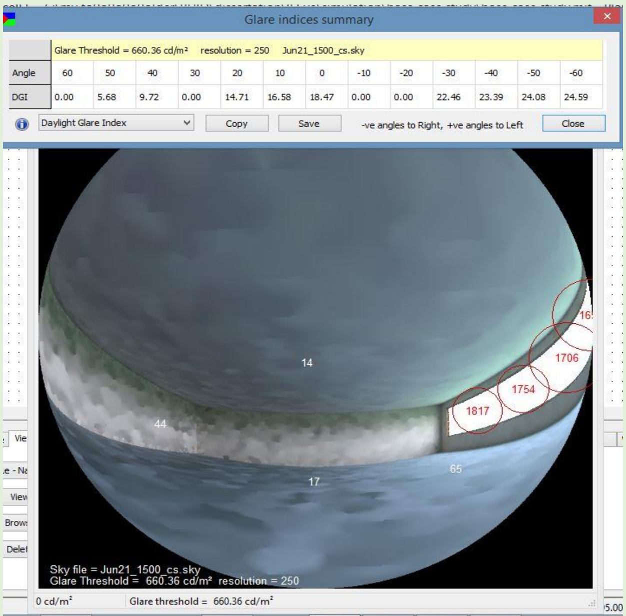
Table 105: Daylight and Glare Analysis for Jun 21, with clear sky, (E), (P1),(T15).

Daylight and Glare Analysis for Jun 21, (clear sky), (E), (P1) (T15).

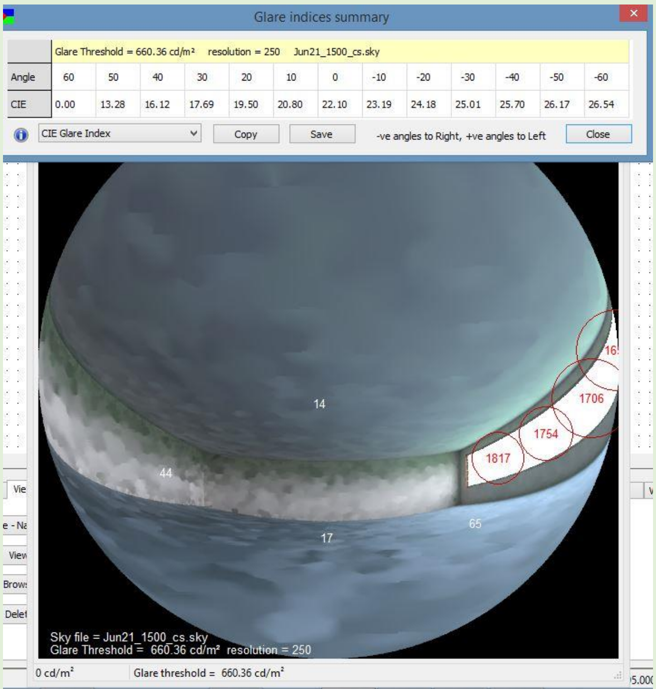
DGP



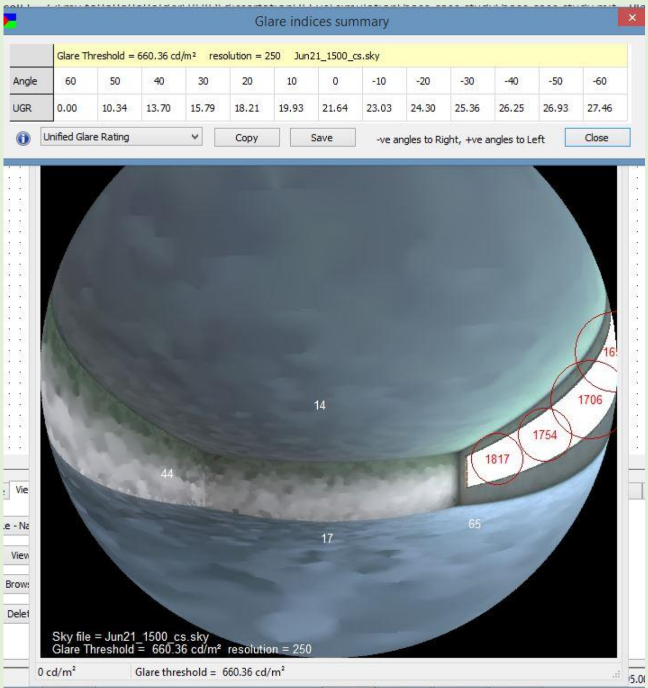
DGI



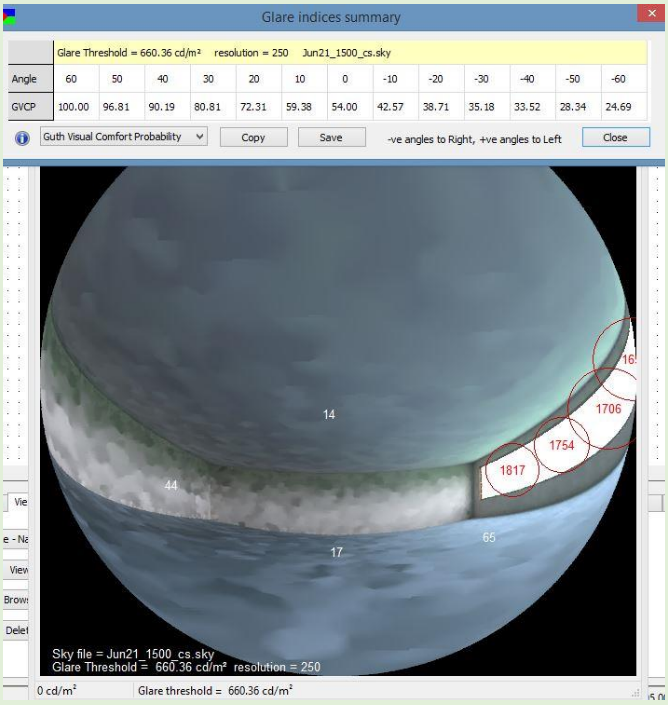
CGI



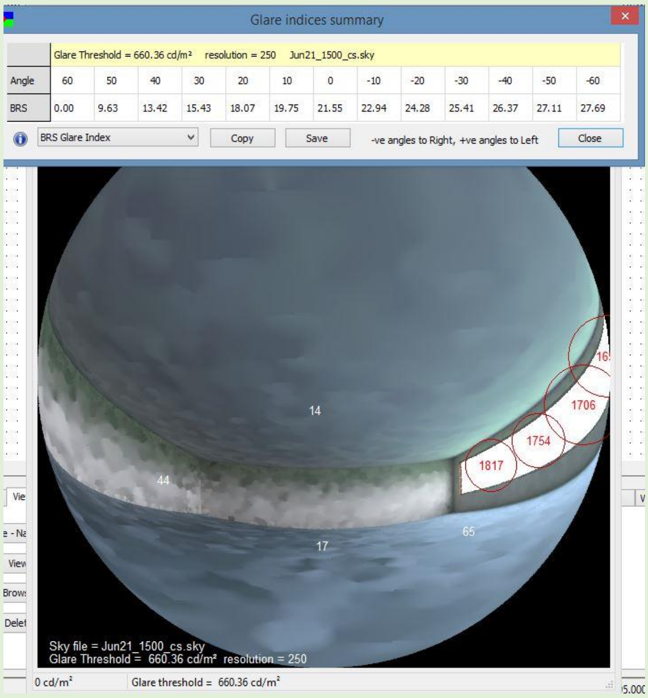
UGR



VCP


Glare indices summary
Glare Threshold = 660.36 cd/m² resolution = 250 Jun21_1500_cs.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 100.00 96.81 90.19 80.81 72.31 59.38 54.00 42.57 38.71 35.18 33.52 28.34 24.69
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
14
1706
1754
1817
44
17
65
Sky file = Jun21_1500_cs.sky
Glare Threshold = 660.36 cd/m² resolution = 250
0 cd/m²
Glare threshold = 660.36 cd/m²

BRS


Glare indices summary
Glare Threshold = 660.36 cd/m² resolution = 250 Jun21_1500_cs.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 0.00 9.63 13.42 15.43 18.07 19.75 21.55 22.94 24.28 25.41 26.37 27.11 27.69
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
14
1706
1754
1817
44
17
65
Sky file = Jun21_1500_cs.sky
Glare Threshold = 660.36 cd/m² resolution = 250
0 cd/m²
Glare threshold = 660.36 cd/m²

GDGR

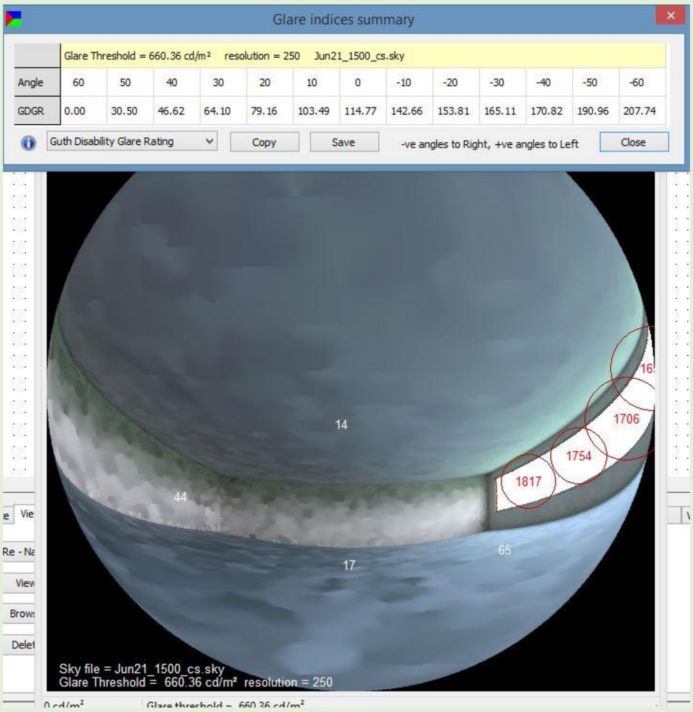
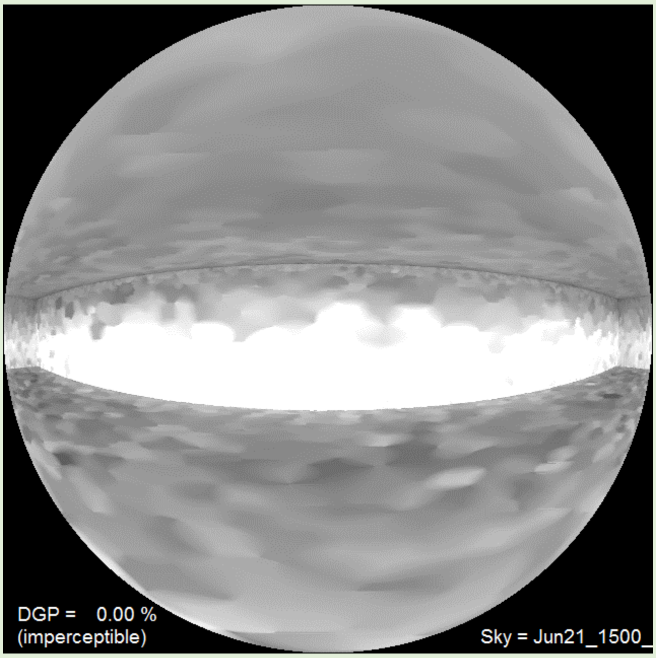

Glare indices summary
Glare Threshold = 660.36 cd/m² resolution = 250 Jun21_1500_cs.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 0.00 30.50 46.62 64.10 79.16 103.49 114.77 142.66 153.81 165.11 170.82 190.96 207.74
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
14
1706
1754
1817
44
17
65
Sky file = Jun21_1500_cs.sky
Glare Threshold = 660.36 cd/m² resolution = 250

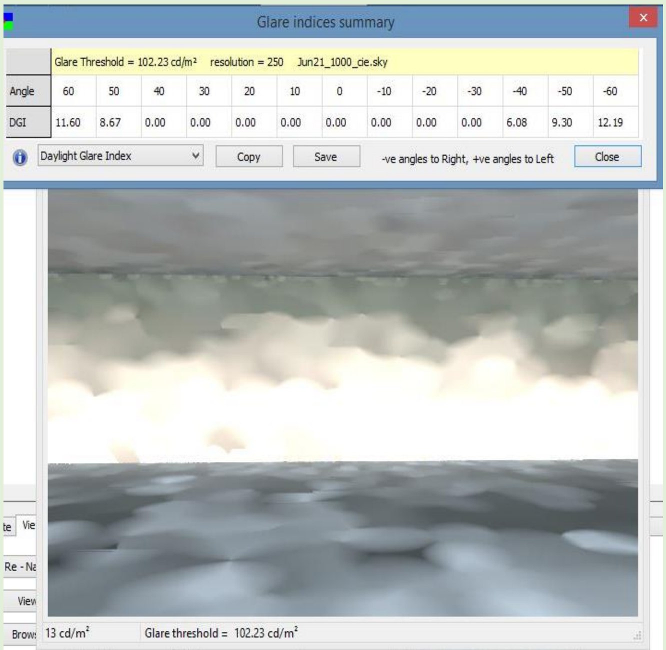
Table 106: Daylight and Glare Analysis for Jun 21, with clear sky, (clear sky), (E), (P2),(T9).

Daylight and Glare Analysis for Jun 21, (clear sky), (E), (P2) (T9).

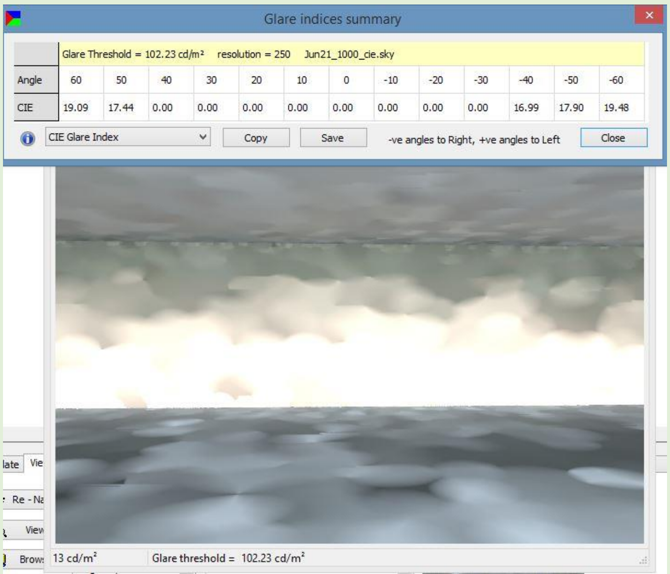
DGP



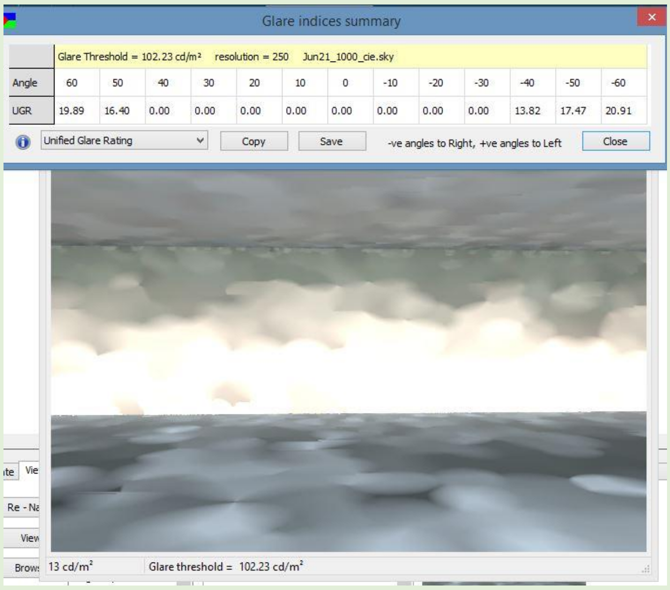
DGI



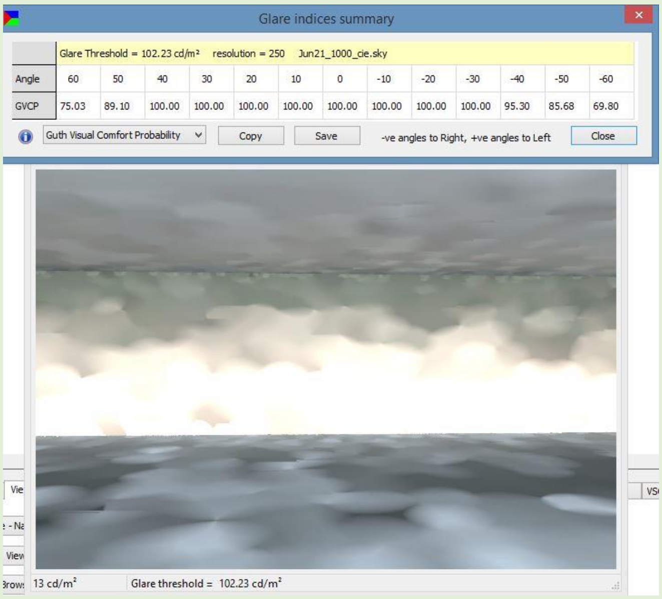
CGI



UGR

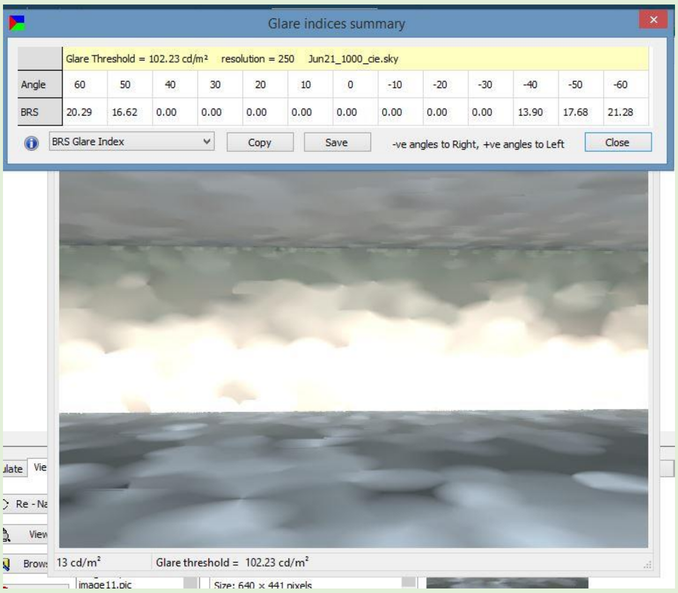


VCP



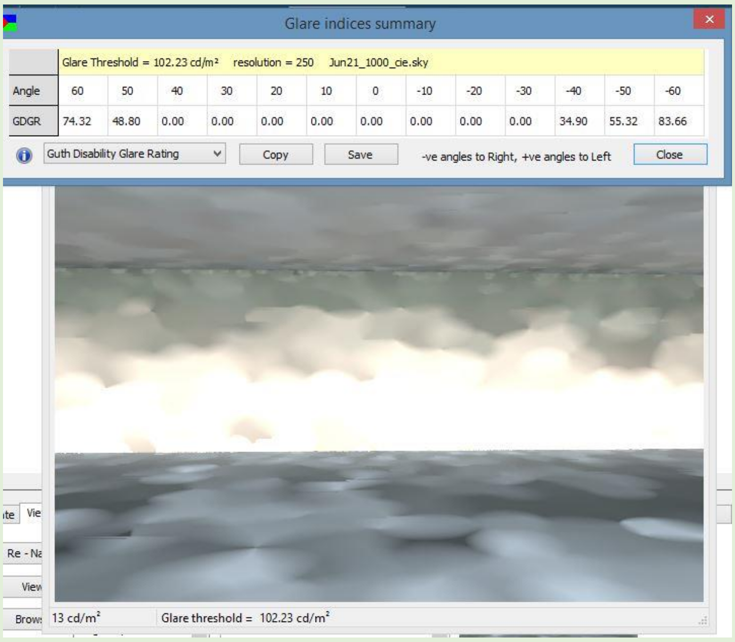
Angle	60	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
GVCP	75.03	89.10	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	95.30	85.68	69.80

BRS



Angle	60	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
BRS	20.29	16.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.90	17.68	21.28

GDGR

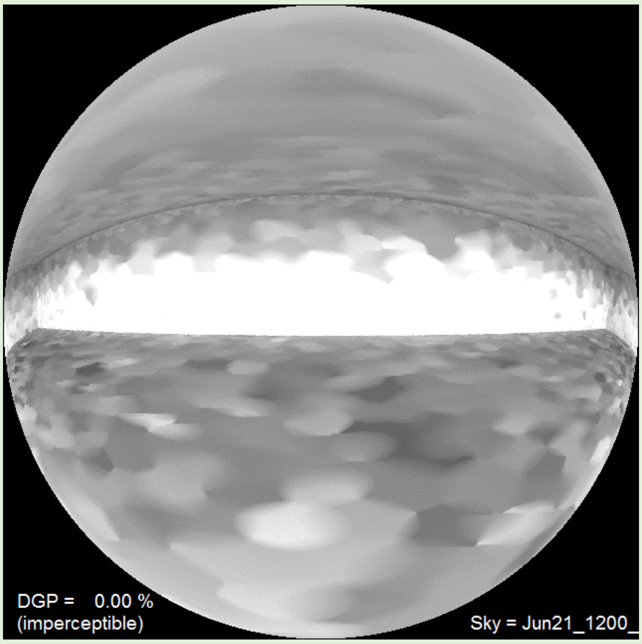


Angle	60	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
GDGR	74.32	48.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	34.90	55.32	83.66

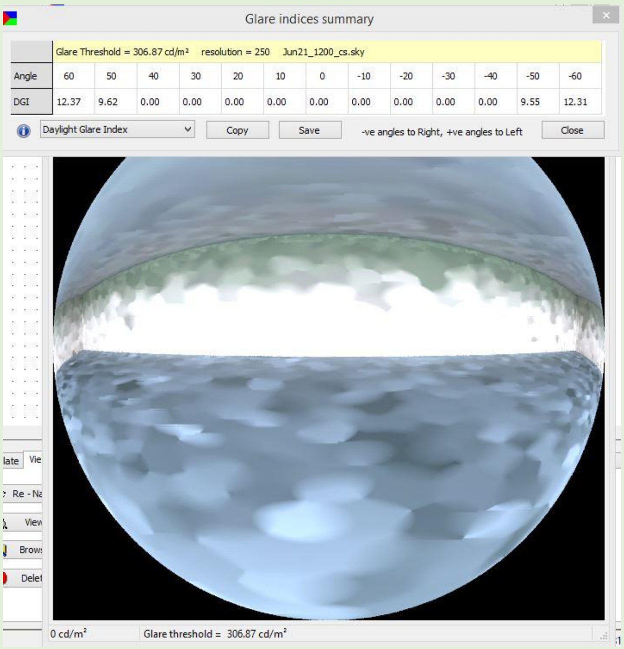
Table 107: Daylight and Glare Analysis for Jun 21, with clear sky, (E), (P2),(T12).

Daylight and Glare Analysis for Jun 21, (clear sky), (E), (P2) (T12).

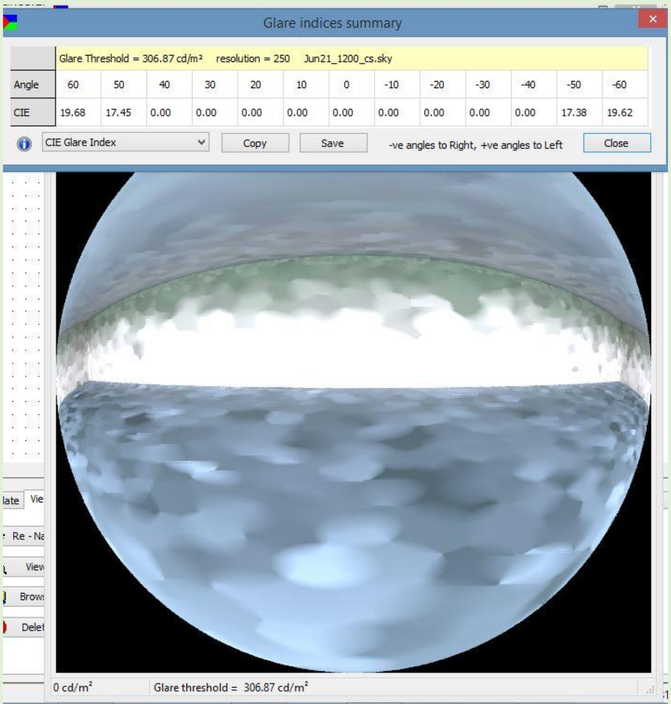
DGP



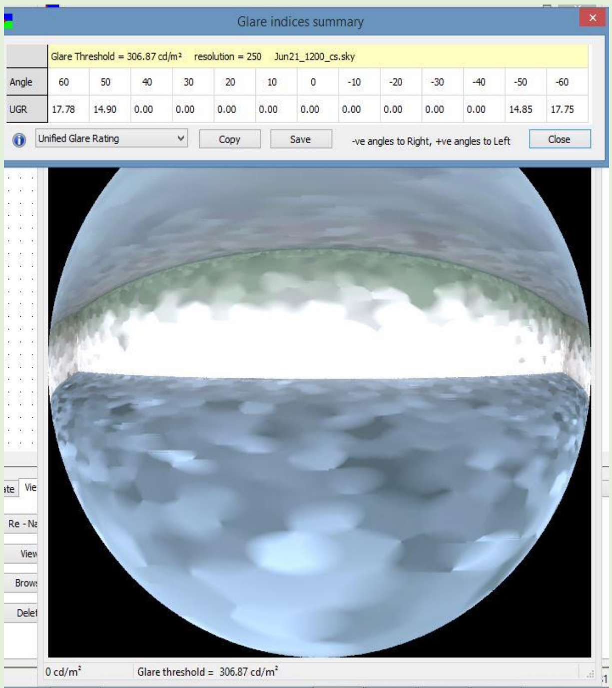
DGI



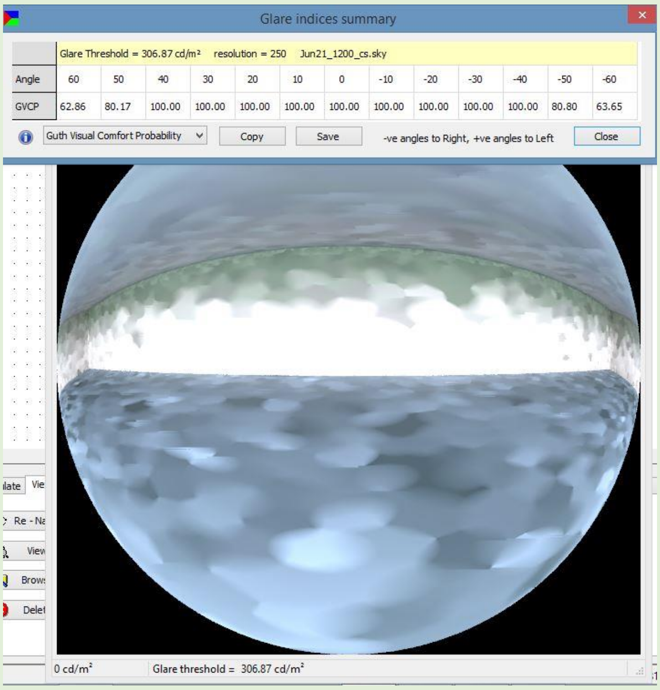
CGI



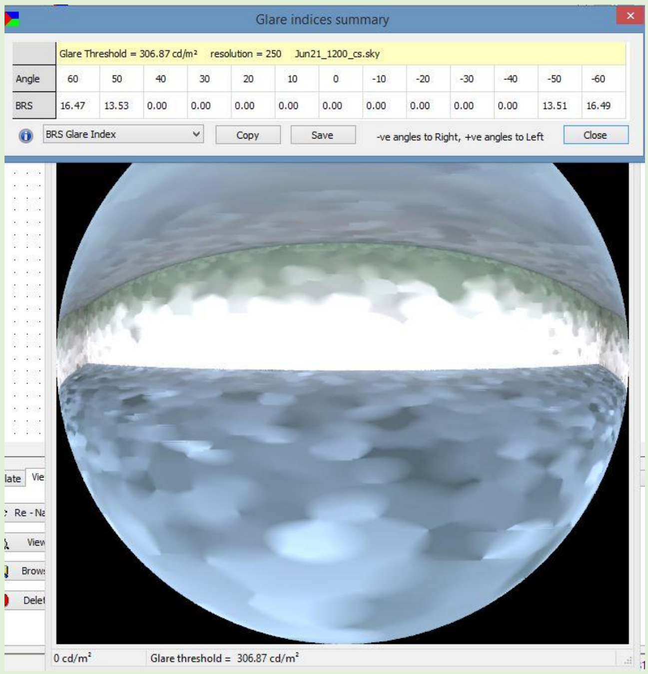
UGR



VCP


Glare indices summary
Glare Threshold = 306.87 cd/m² resolution = 250 Jun21_1200_cs.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 62.86 80.17 100.00 100.00 100.00 100.00 100.00 100.00 100.00 100.00 100.00 80.80 63.65
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
0 cd/m²
Glare threshold = 306.87 cd/m²

BRS


Glare indices summary
Glare Threshold = 306.87 cd/m² resolution = 250 Jun21_1200_cs.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 16.47 13.53 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 13.51 16.49
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
0 cd/m²
Glare threshold = 306.87 cd/m²

GDGR

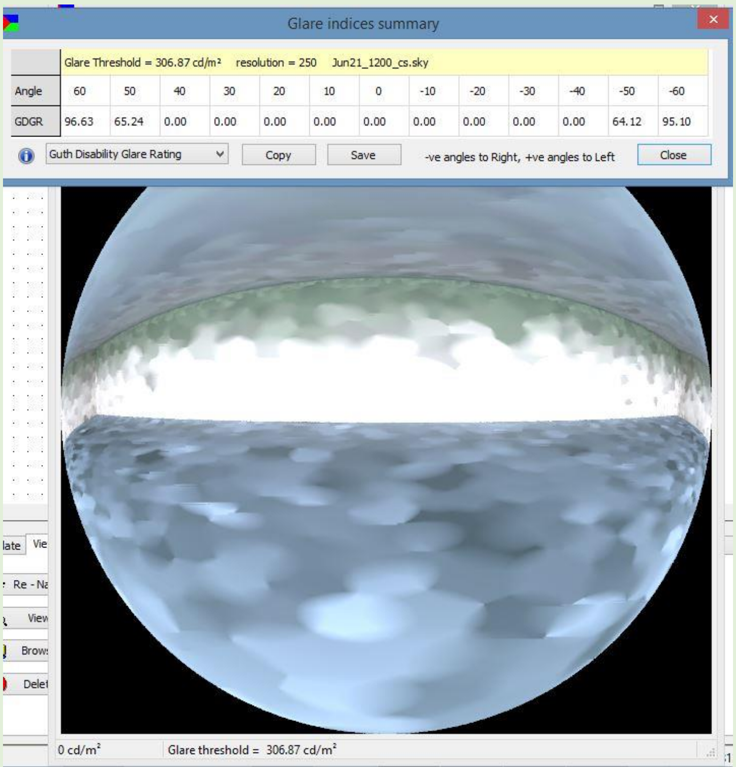
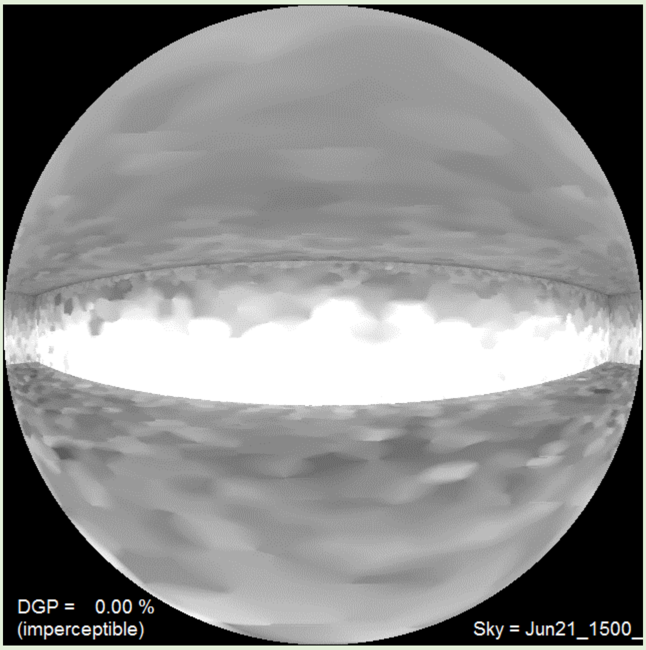

Glare indices summary
Glare Threshold = 306.87 cd/m² resolution = 250 Jun21_1200_cs.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 96.63 65.24 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 64.12 95.10
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
0 cd/m²
Glare threshold = 306.87 cd/m²

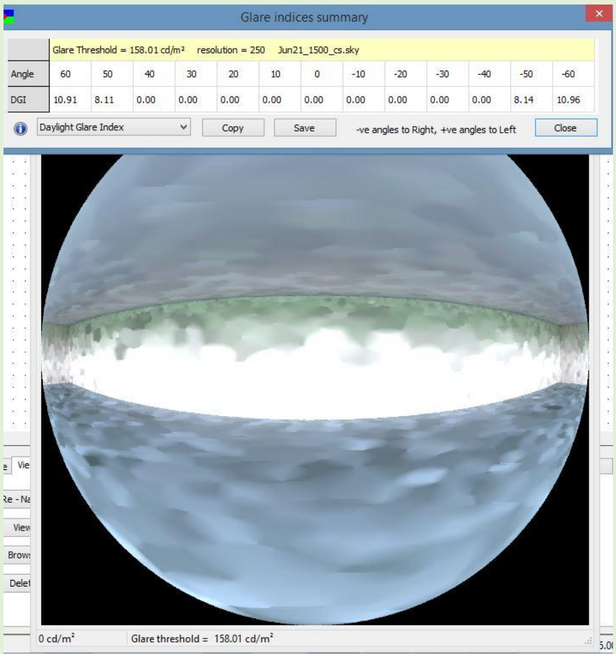
Table 108: Daylight and Glare Analysis for Jun 21, with clear sky, (E), (P2),(T15).

Daylight and Glare Analysis for Jun 21, (clear sky), (E), (P2) (T15).

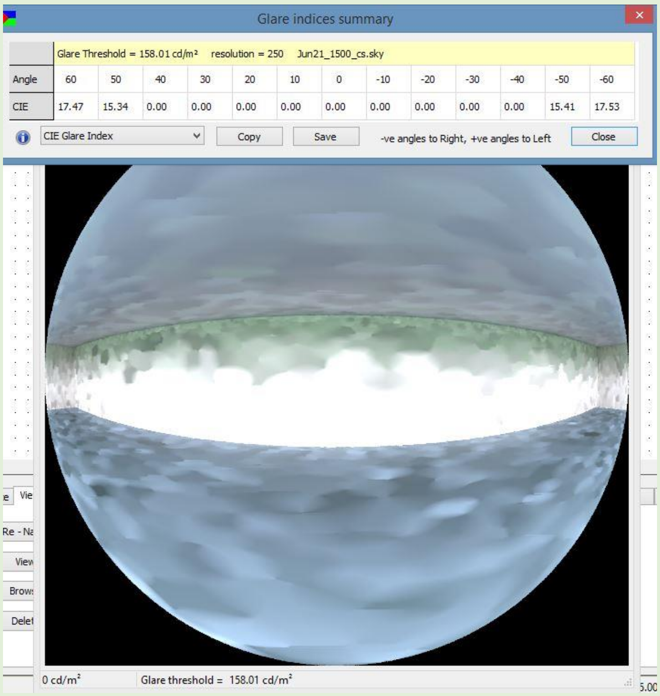
DGP



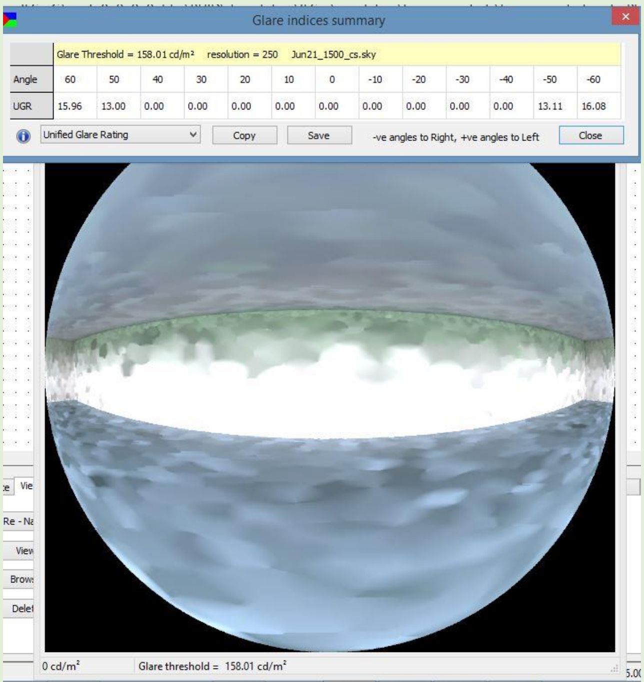
DGI



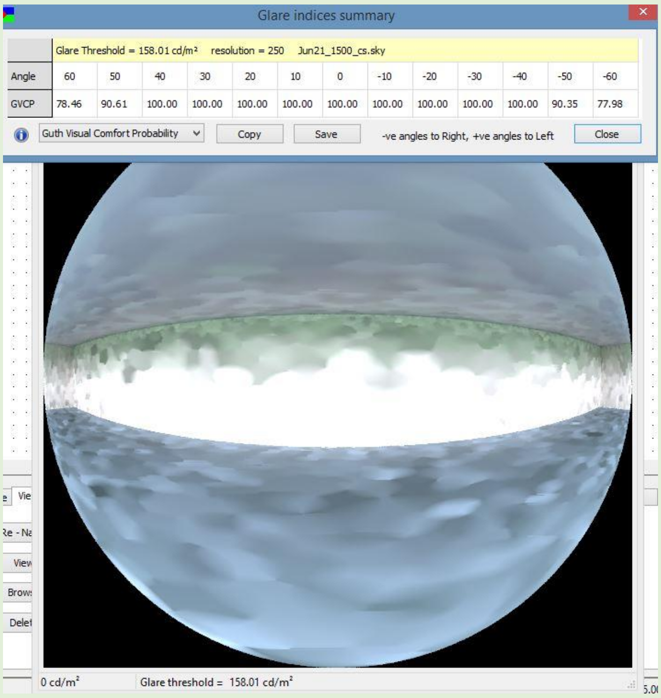
CGI



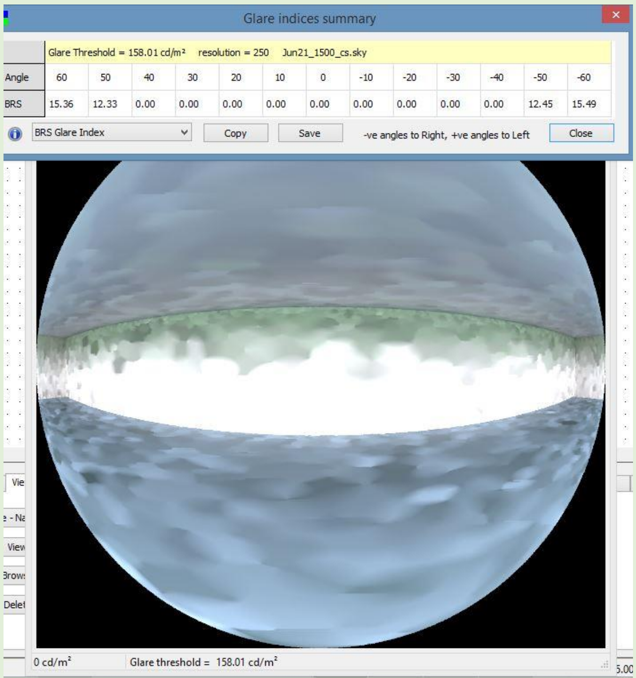
UGR



VCP


Glare indices summary
Glare Threshold = 158.01 cd/m² resolution = 250 Jun21_1500_cs.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 78.46 90.61 100.00 100.00 100.00 100.00 100.00 100.00 100.00 100.00 100.00 90.35 77.98
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
0 cd/m²
Glare threshold = 158.01 cd/m²

BRS


Glare indices summary
Glare Threshold = 158.01 cd/m² resolution = 250 Jun21_1500_cs.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 15.36 12.33 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 12.45 15.49
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
0 cd/m²
Glare threshold = 158.01 cd/m²

GDGR

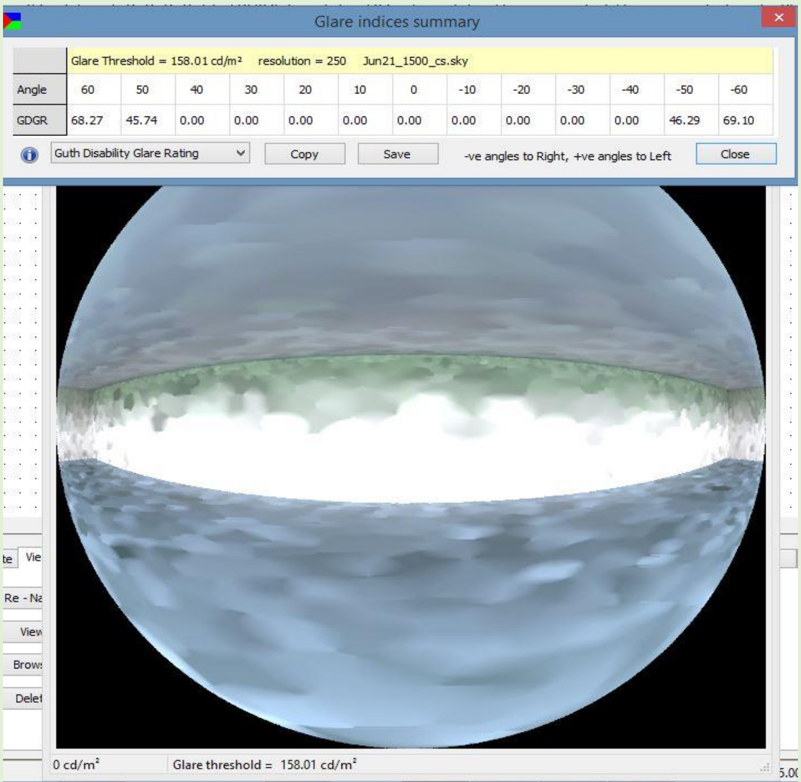
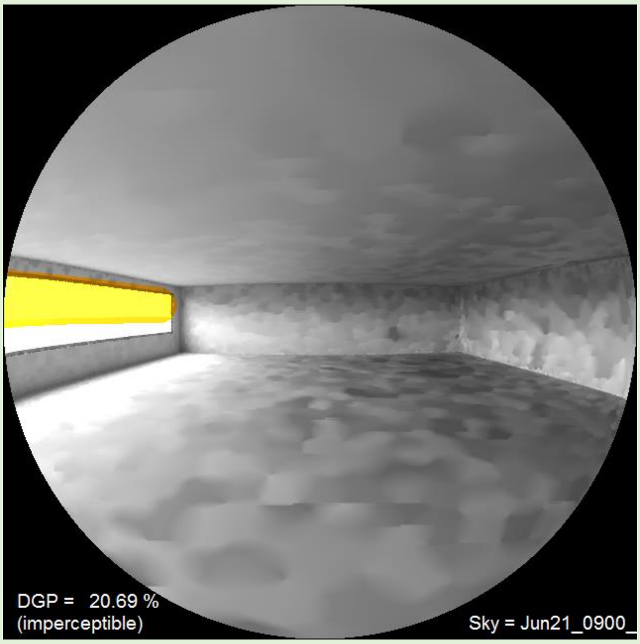

Glare indices summary
Glare Threshold = 158.01 cd/m² resolution = 250 Jun21_1500_cs.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 68.27 45.74 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 46.29 69.10
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
0 cd/m²
Glare threshold = 158.01 cd/m²

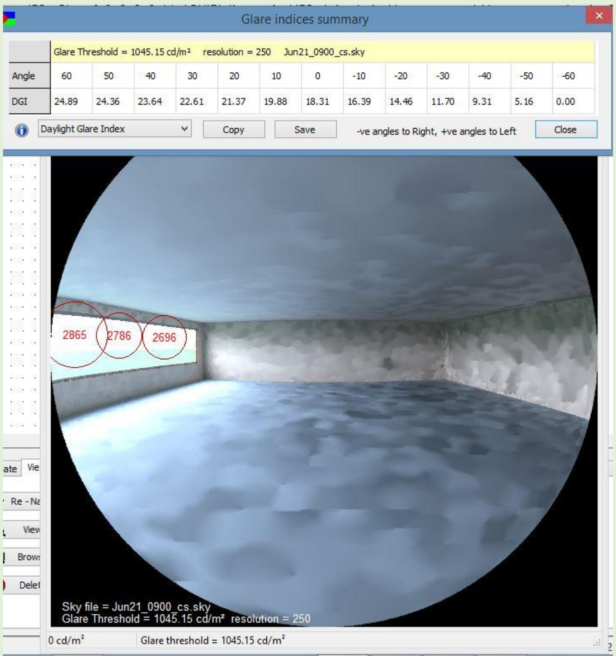
Table 109: Daylight and Glare Analysis for Jun 21, with clear sky, (E), (P3),(T9).

Daylight and Glare Analysis for Jun 21, (clear sky), (E), (P3) (T9).

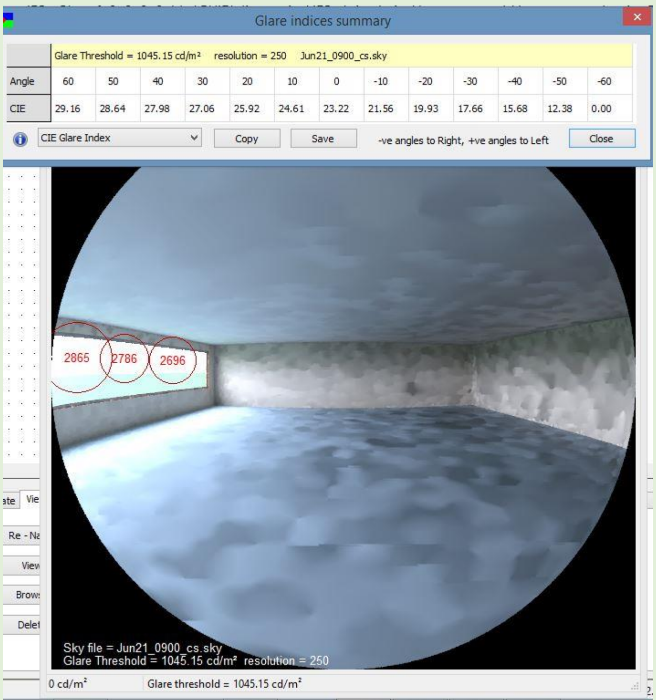
DGP



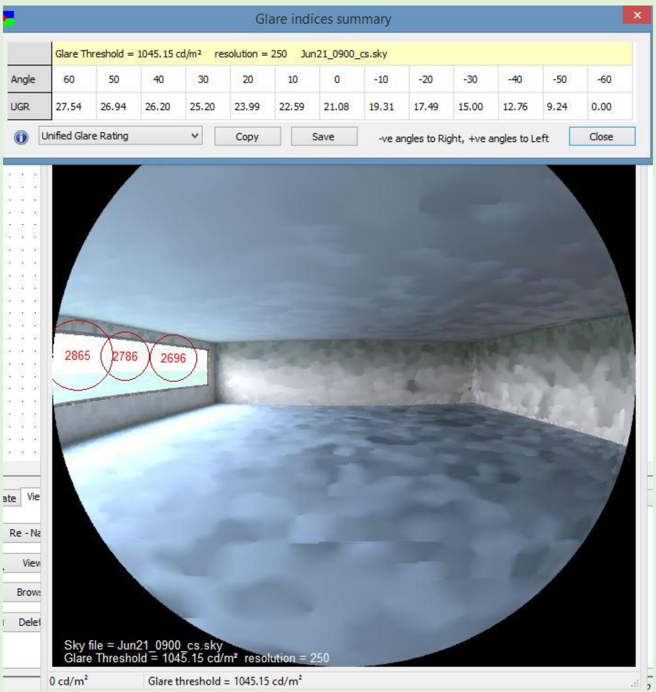
DGI



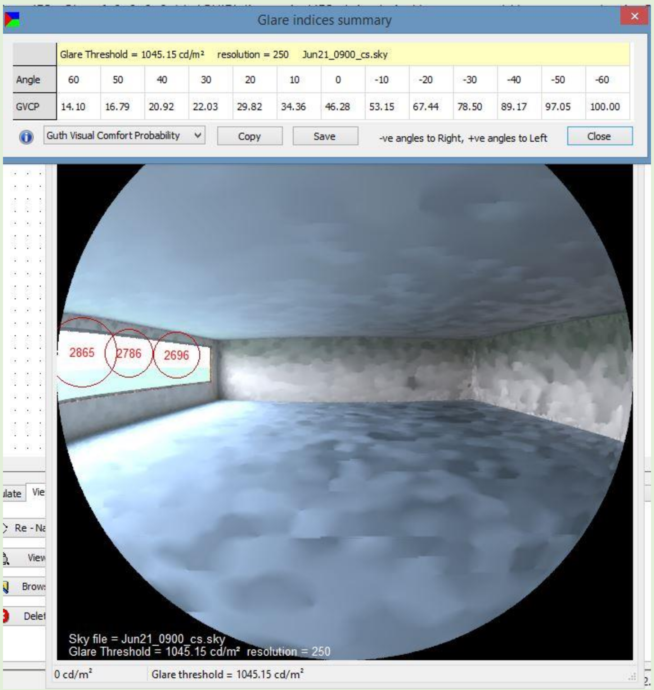
CGI



UGR

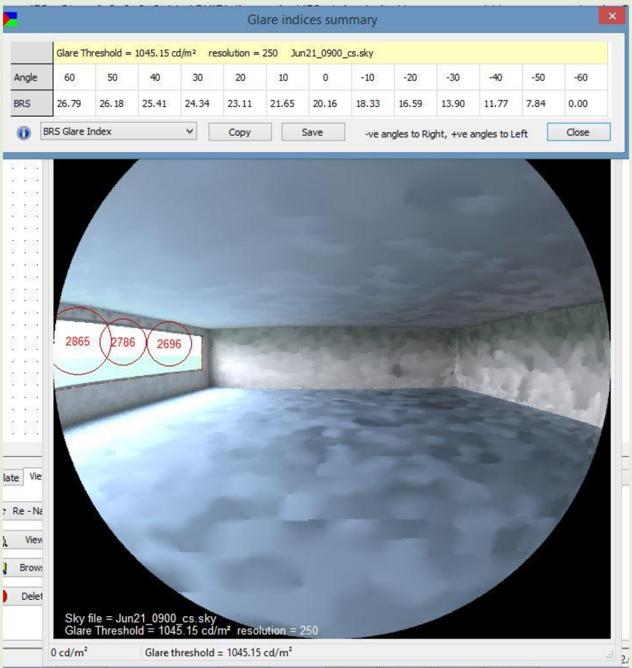


VCP



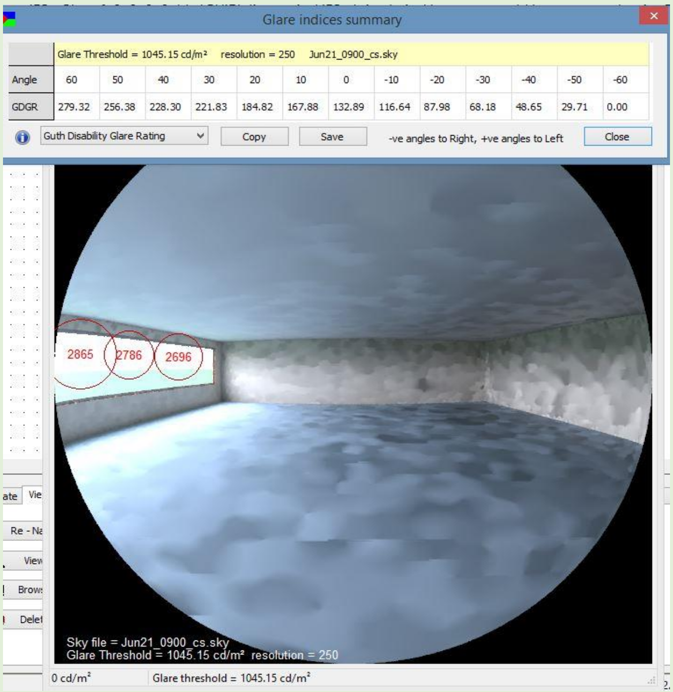
Glare indices summary
Glare Threshold = 1045.15 cd/m² resolution = 250 Jun21_0900_cs.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 14.10 16.79 20.92 22.03 29.82 34.36 46.28 53.15 67.44 78.50 89.17 97.05 100.00
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2865
2786
2696
Sky file = Jun21_0900_cs.sky
Glare Threshold = 1045.15 cd/m² resolution = 250
0 cd/m²
Glare threshold = 1045.15 cd/m²

BRS



Glare indices summary
Glare Threshold = 1045.15 cd/m² resolution = 250 Jun21_0900_cs.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 26.79 26.18 25.41 24.34 23.11 21.65 20.16 18.33 16.59 13.90 11.77 7.84 0.00
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2865
2786
2696
Sky file = Jun21_0900_cs.sky
Glare Threshold = 1045.15 cd/m² resolution = 250
0 cd/m²
Glare threshold = 1045.15 cd/m²

GDGR

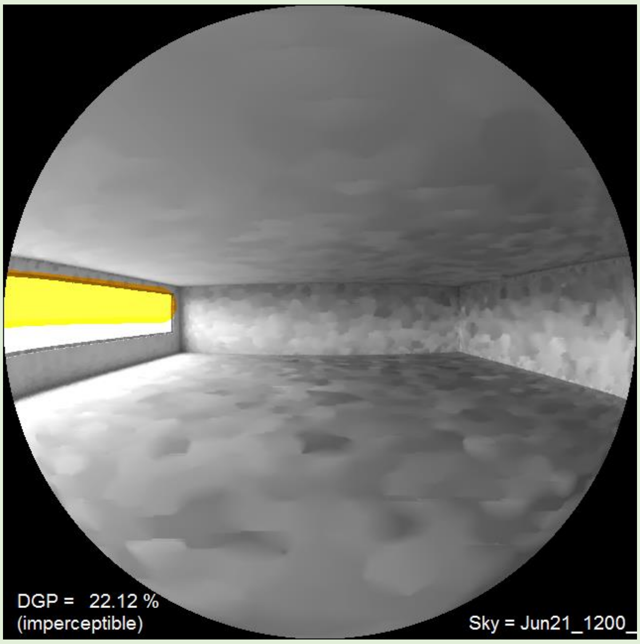


Glare indices summary
Glare Threshold = 1045.15 cd/m² resolution = 250 Jun21_0900_cs.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 279.32 256.38 228.30 221.83 184.82 167.88 132.89 116.64 87.98 68.18 48.65 29.71 0.00
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2865
2786
2696
Sky file = Jun21_0900_cs.sky
Glare Threshold = 1045.15 cd/m² resolution = 250
0 cd/m²
Glare threshold = 1045.15 cd/m²

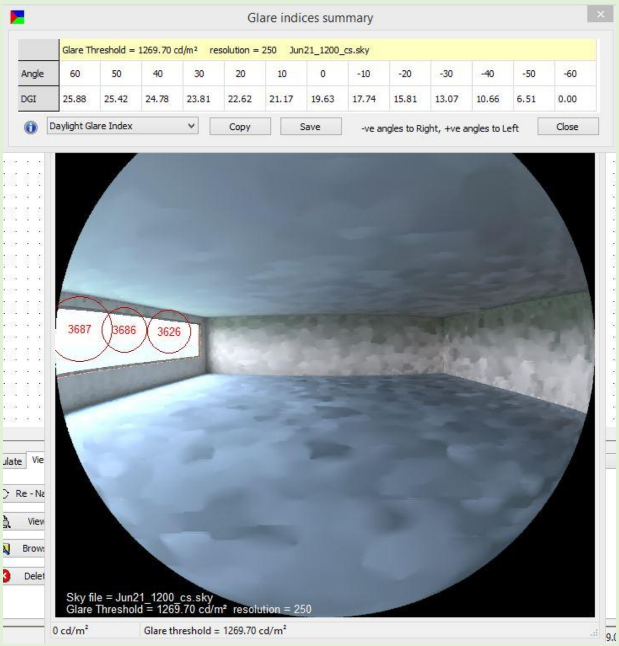
Table 110: Daylight and Glare Analysis for Jun 21, with clear sky, (E), (P3),(T12).

Daylight and Glare Analysis for Jun 21, (clear sky), (E), (P3) (T12).

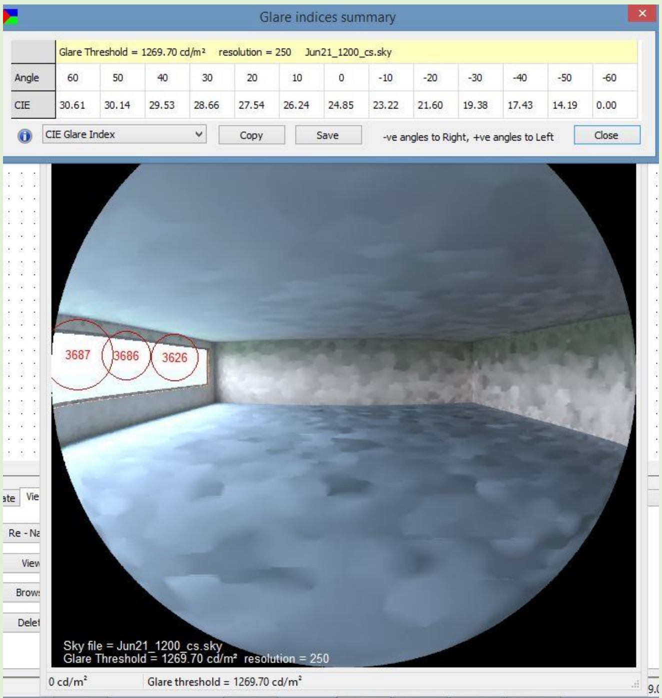
DGP



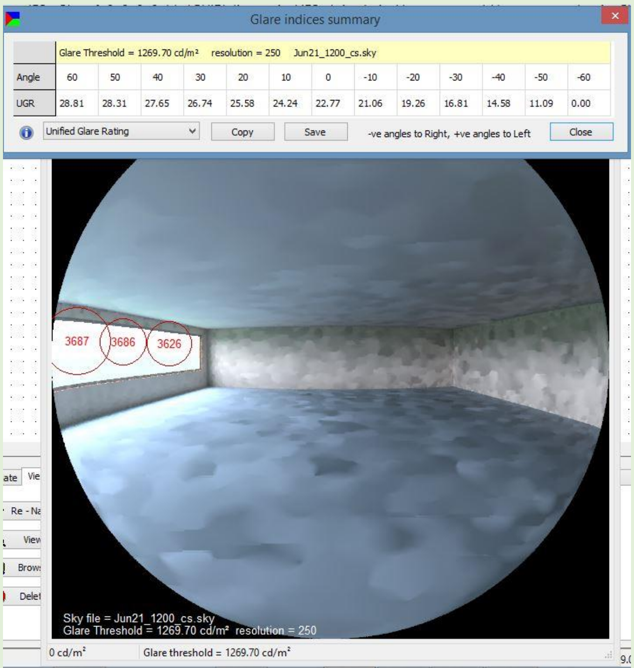
DGI



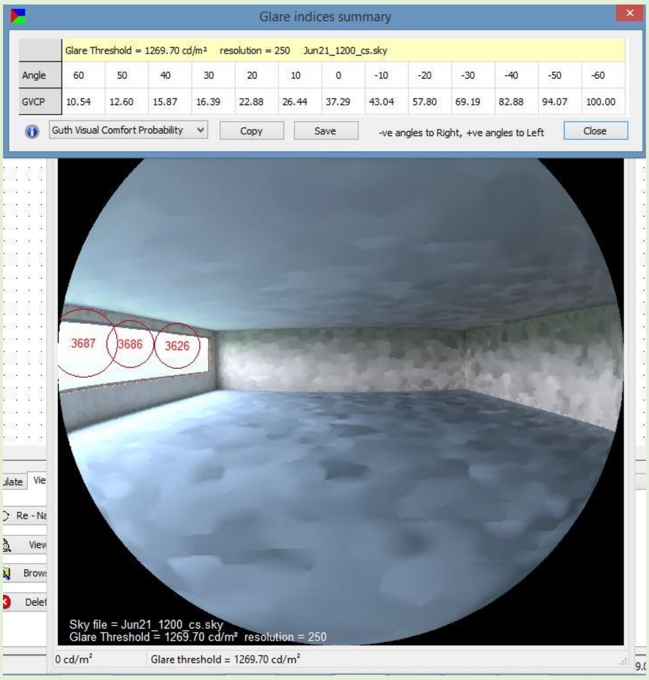
CGI



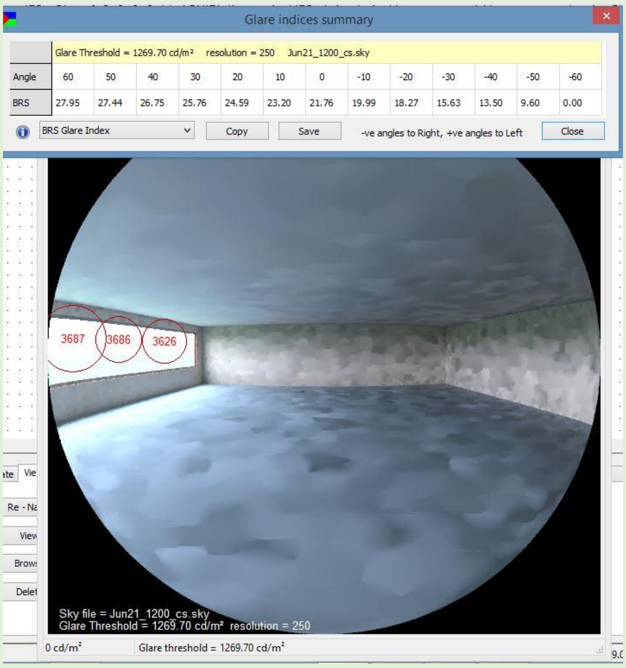
UGR



VCP


Glare indices summary
Glare Threshold = 1269.70 cd/m² resolution = 250 Jun21_1200_cs.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 10.54 12.60 15.87 16.39 22.88 26.44 37.29 43.04 57.80 69.19 82.88 94.07 100.00
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3687
3686
3626
Sky file = Jun21_1200_cs.sky
Glare Threshold = 1269.70 cd/m² resolution = 250
0 cd/m²
Glare threshold = 1269.70 cd/m²

BRS


Glare indices summary
Glare Threshold = 1269.70 cd/m² resolution = 250 Jun21_1200_cs.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 27.95 27.44 26.75 25.76 24.59 23.20 21.76 19.99 18.27 15.63 13.50 9.60 0.00
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3687
3686
3626
Sky file = Jun21_1200_cs.sky
Glare Threshold = 1269.70 cd/m² resolution = 250
0 cd/m²
Glare threshold = 1269.70 cd/m²

GDGR

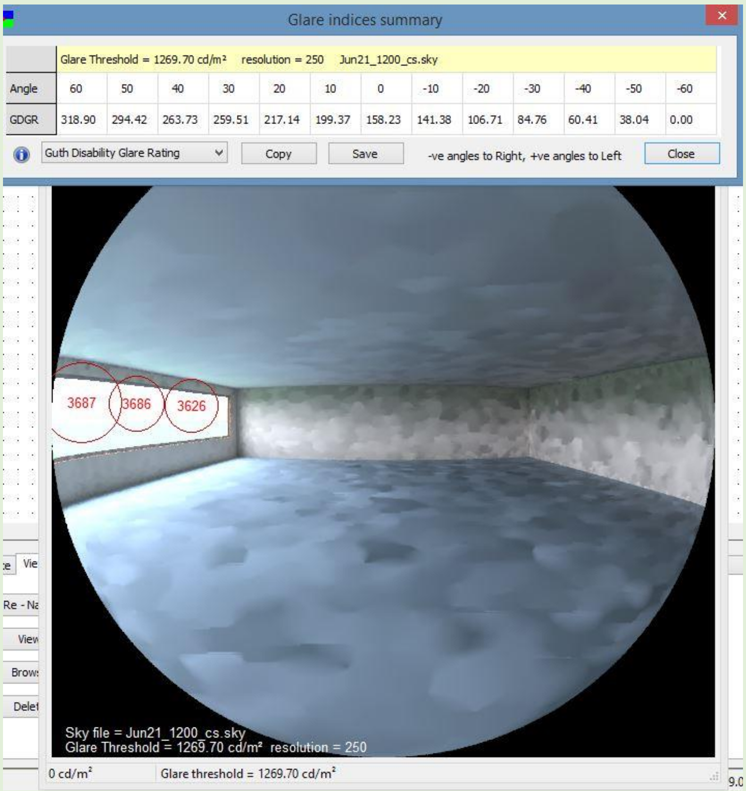
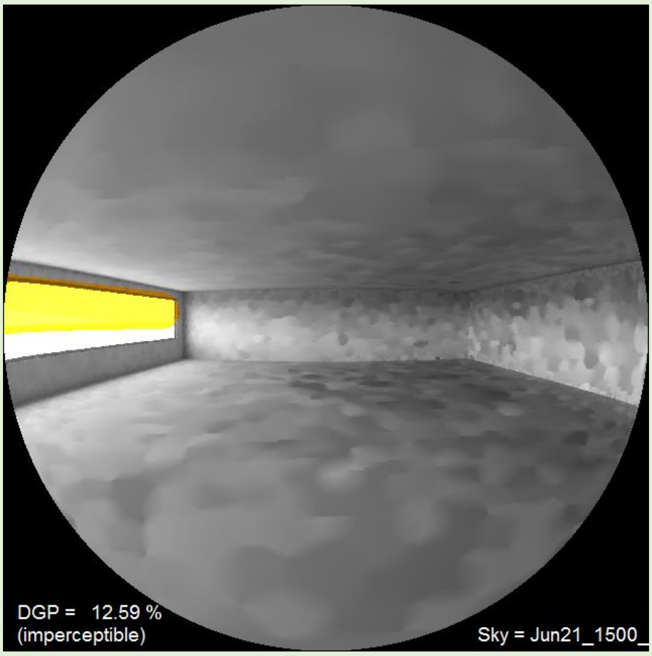

Glare indices summary
Glare Threshold = 1269.70 cd/m² resolution = 250 Jun21_1200_cs.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 318.90 294.42 263.73 259.51 217.14 199.37 158.23 141.38 106.71 84.76 60.41 38.04 0.00
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3687
3686
3626
Sky file = Jun21_1200_cs.sky
Glare Threshold = 1269.70 cd/m² resolution = 250
0 cd/m²
Glare threshold = 1269.70 cd/m²

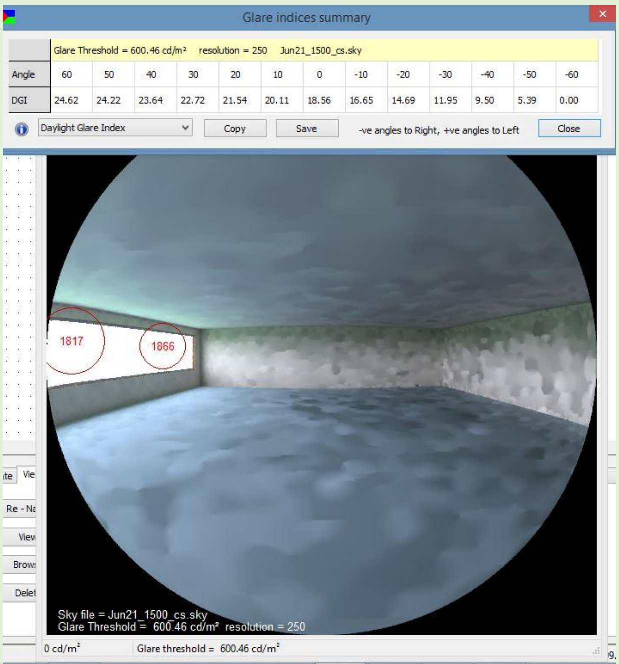
Table 111: Daylight and Glare Analysis for Jun 21, with clear sky, (E), (P3),(T15).

Daylight and Glare Analysis for Jun 21, (clear sky), (E), (P3) (T15).

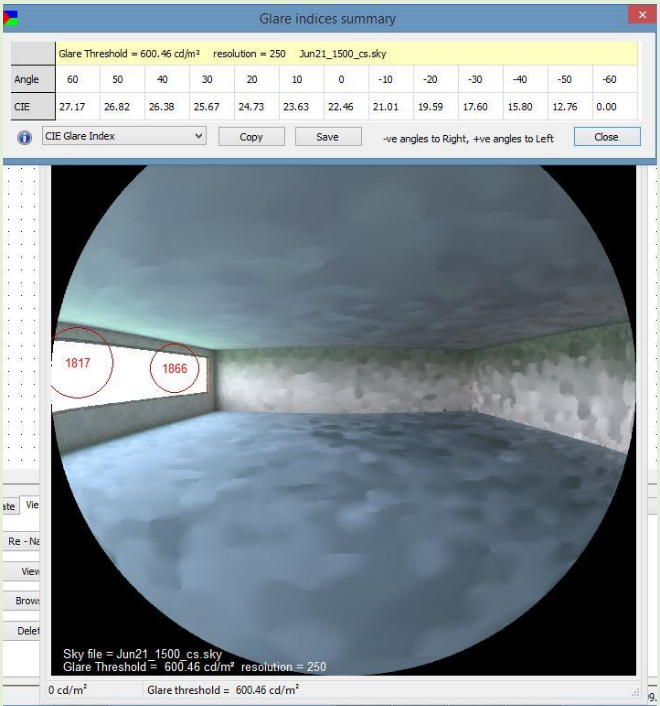
DGP



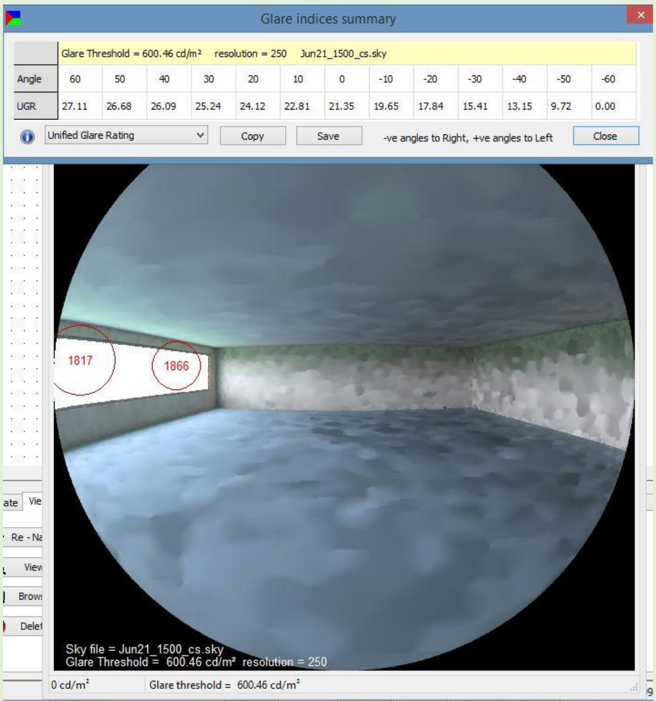
DGI



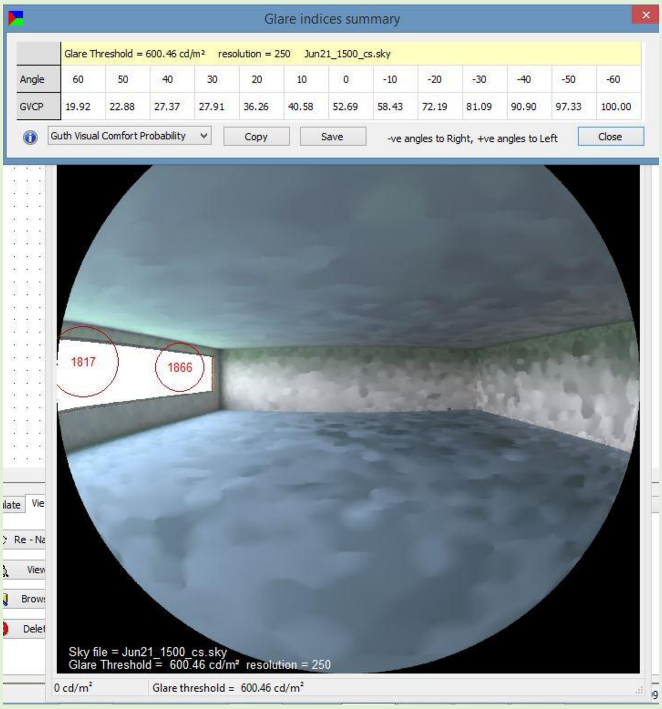
CGI



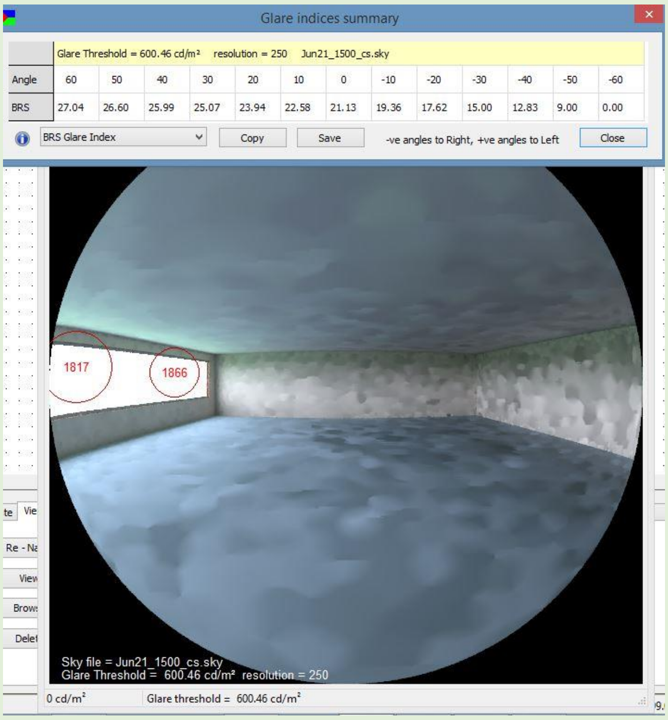
UGR



VCP


Glare indices summary
Glare Threshold = 600.46 cd/m² resolution = 250 Jun21_1500_cs.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 19.92 22.88 27.37 27.91 36.26 40.58 52.69 58.43 72.19 81.09 90.90 97.33 100.00
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1817
1866
Sky file = Jun21_1500_cs.sky
Glare Threshold = 600.46 cd/m² resolution = 250
0 cd/m²
Glare threshold = 600.46 cd/m²

BRS


Glare indices summary
Glare Threshold = 600.46 cd/m² resolution = 250 Jun21_1500_cs.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 27.04 26.60 25.99 25.07 23.94 22.58 21.13 19.36 17.62 15.00 12.83 9.00 0.00
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1817
1866
Sky file = Jun21_1500_cs.sky
Glare Threshold = 600.46 cd/m² resolution = 250
0 cd/m²
Glare threshold = 600.46 cd/m²

GDGR

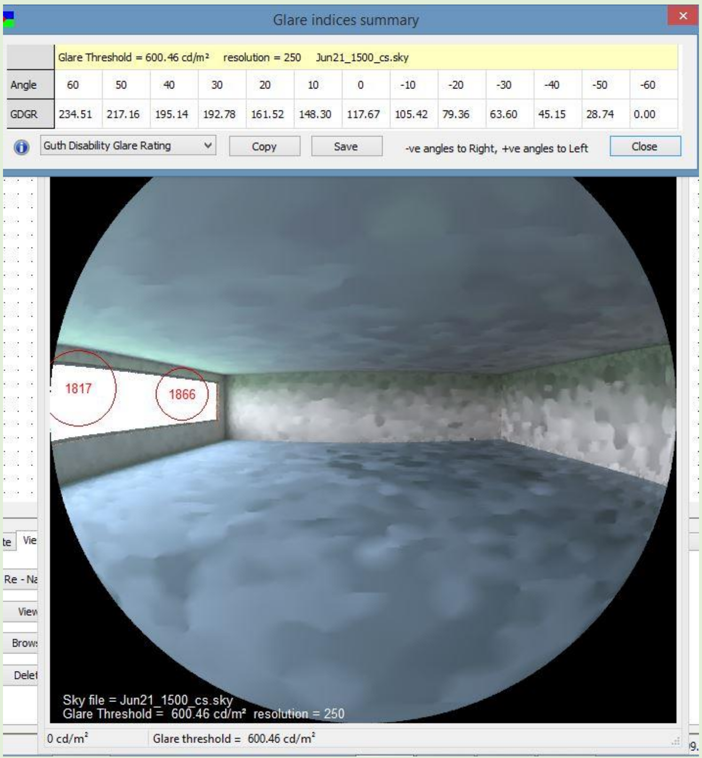
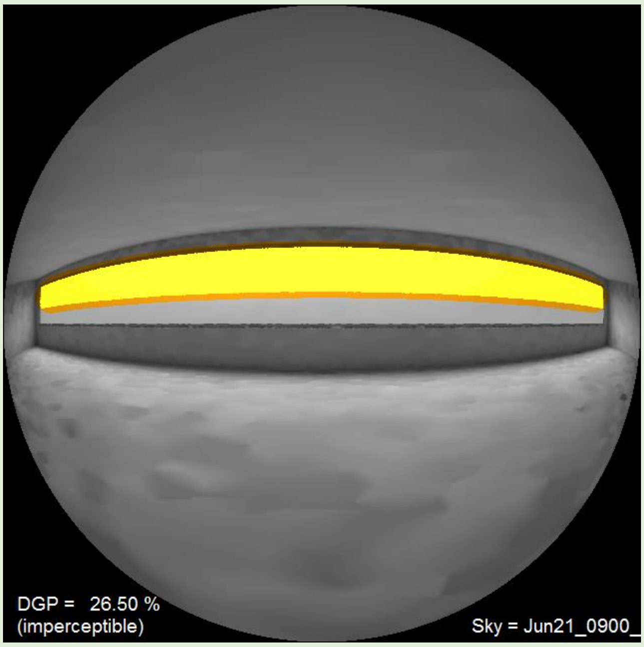

Glare indices summary
Glare Threshold = 600.46 cd/m² resolution = 250 Jun21_1500_cs.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 234.51 217.16 195.14 192.78 161.52 148.30 117.67 105.42 79.36 63.60 45.15 28.74 0.00
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1817
1866
Sky file = Jun21_1500_cs.sky
Glare Threshold = 600.46 cd/m² resolution = 250
0 cd/m²
Glare threshold = 600.46 cd/m²

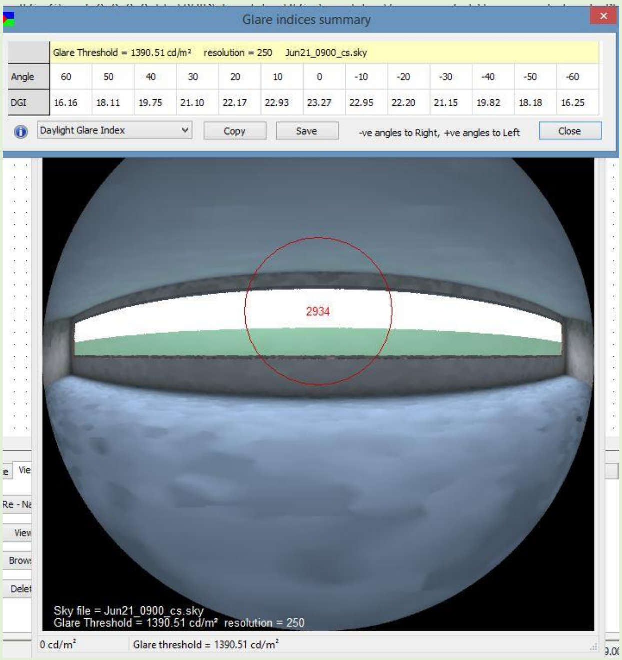
Table 112: Daylight and Glare Analysis for Jun 21, with clear sky, (E), (P4),(T9).

Daylight and Glare Analysis for Jun 21, (clear sky), (E), (P4) (T9).

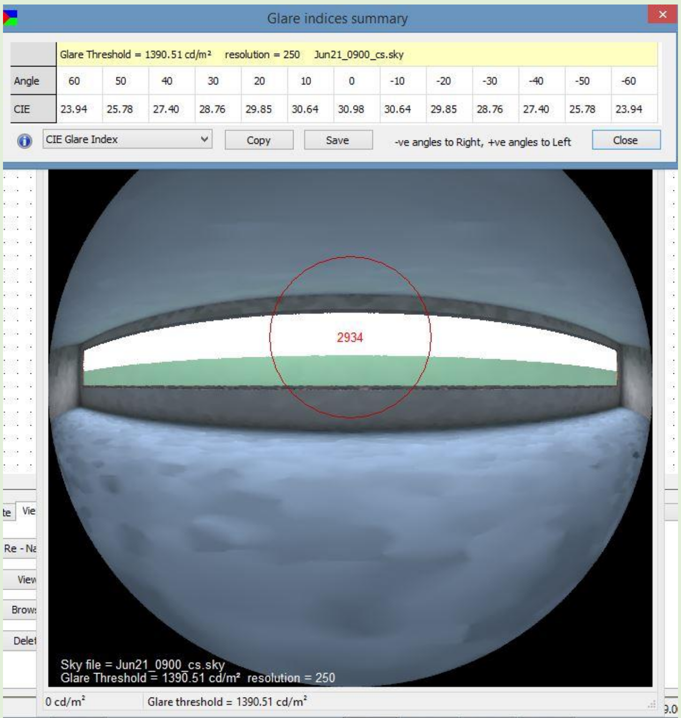
DGP



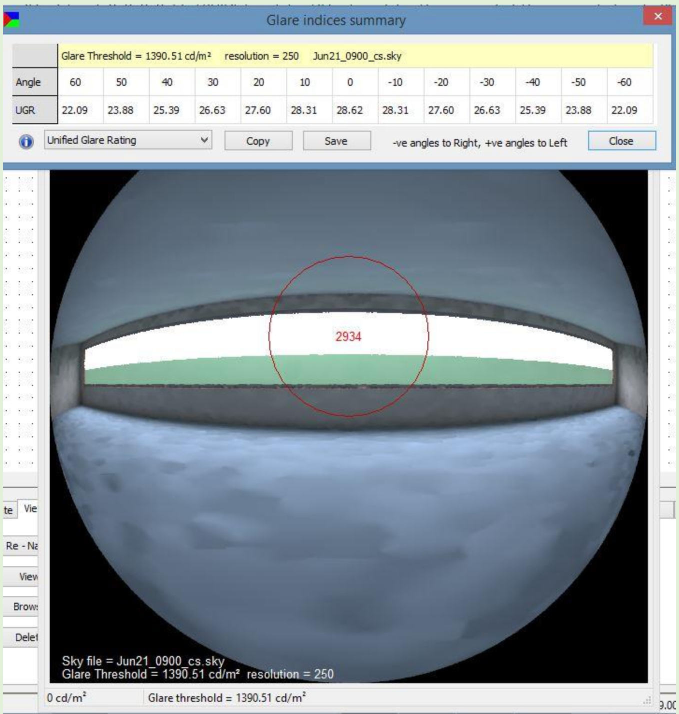
DGI



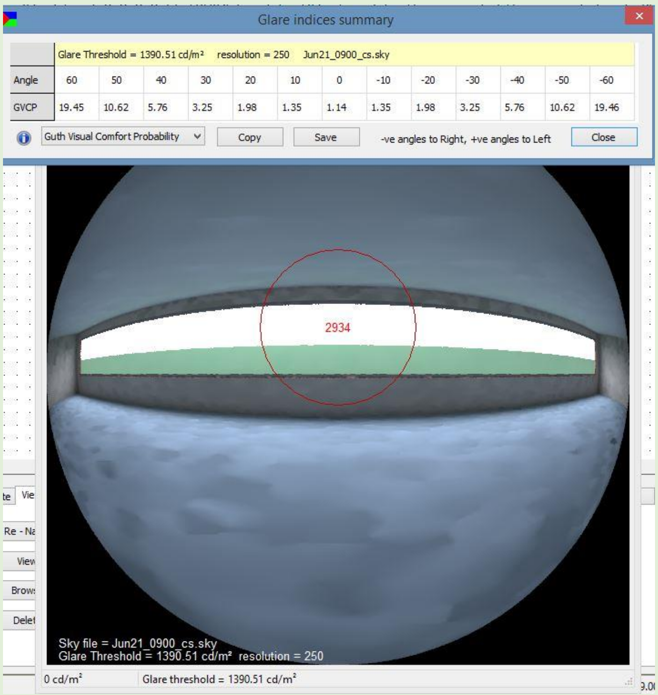
CGI



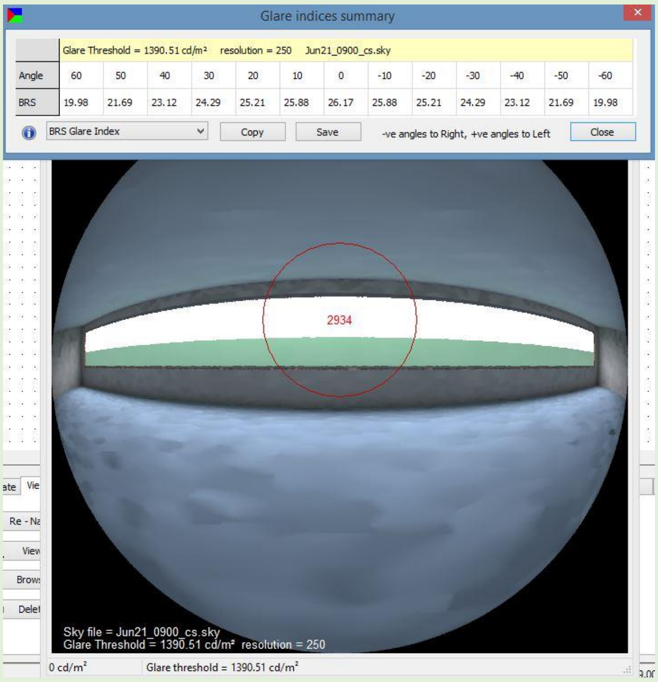
UGR



VCP


Glare indices summary
Glare Threshold = 1390.51 cd/m² resolution = 250 Jun21_0900_cs.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 19.45 10.62 5.76 3.25 1.98 1.35 1.14 1.35 1.98 3.25 5.76 10.62 19.46
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2934
Sky file = Jun21_0900_cs.sky
Glare Threshold = 1390.51 cd/m² resolution = 250
0 cd/m²
Glare threshold = 1390.51 cd/m²

BRS


Glare indices summary
Glare Threshold = 1390.51 cd/m² resolution = 250 Jun21_0900_cs.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 19.98 21.69 23.12 24.29 25.21 25.88 26.17 25.88 25.21 24.29 23.12 21.69 19.98
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2934
Sky file = Jun21_0900_cs.sky
Glare Threshold = 1390.51 cd/m² resolution = 250
0 cd/m²
Glare threshold = 1390.51 cd/m²

GDGR

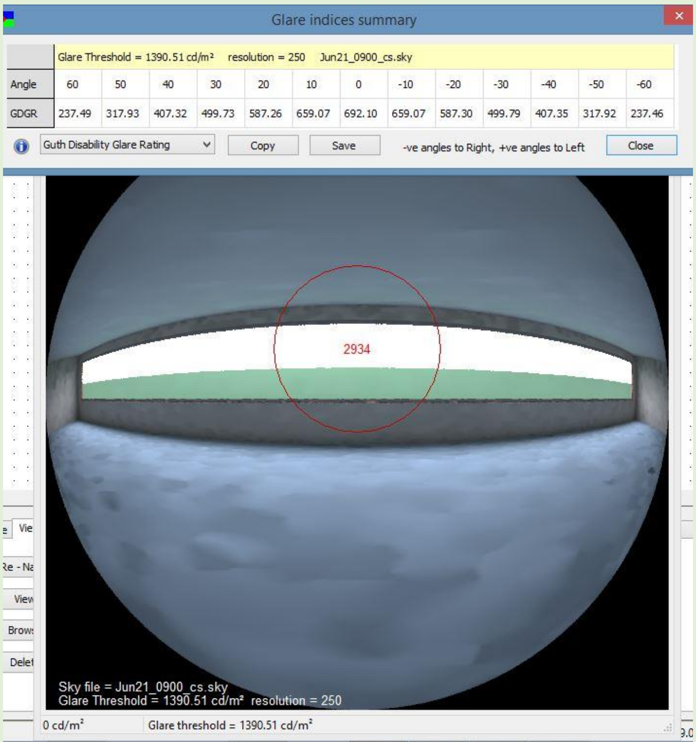
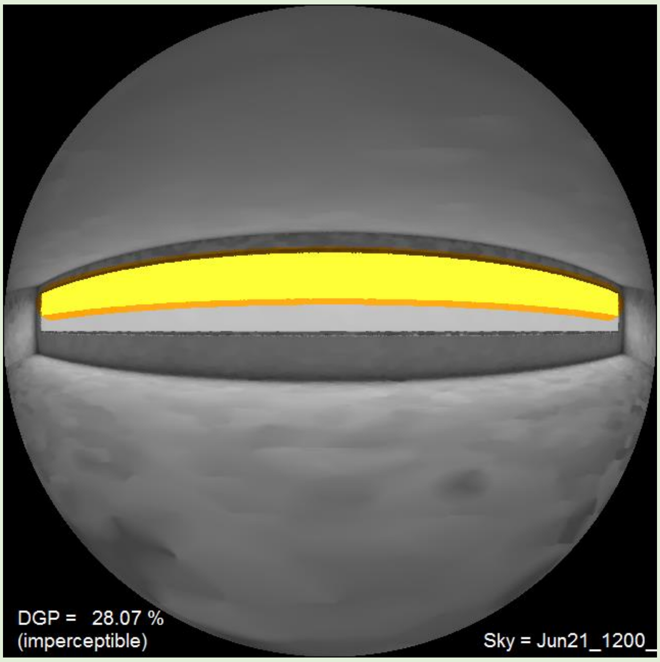

Glare indices summary
Glare Threshold = 1390.51 cd/m² resolution = 250 Jun21_0900_cs.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 237.49 317.93 407.32 499.73 587.26 659.07 692.10 659.07 587.30 499.79 407.35 317.92 237.46
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2934
Sky file = Jun21_0900_cs.sky
Glare Threshold = 1390.51 cd/m² resolution = 250
0 cd/m²
Glare threshold = 1390.51 cd/m²

Table 113: Daylight and Glare Analysis for Jun 21, with clear sky, (E), (P4),(T12).

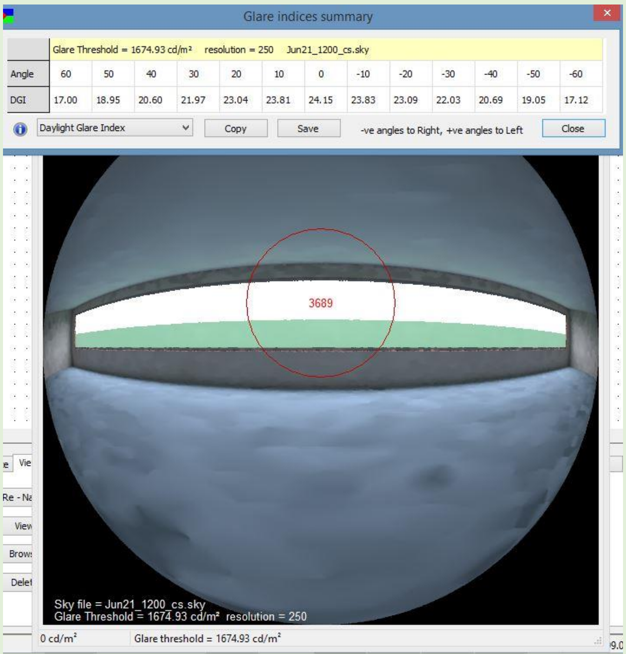
<table>
<tr><th colspan="2">Daylight and Glare Analysis for Jun 21, (clear sky), (E), (P4) (T12).</th></tr>
<tr><td>

DGP



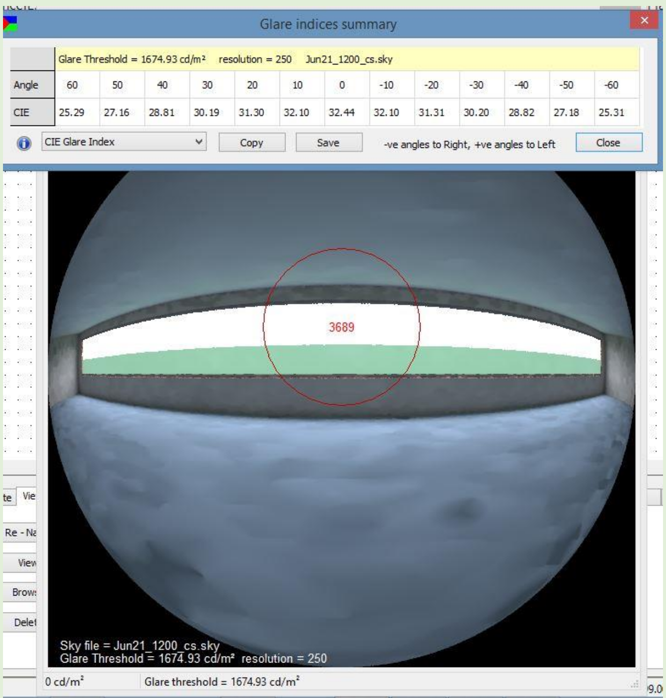
</td><td>

DGI



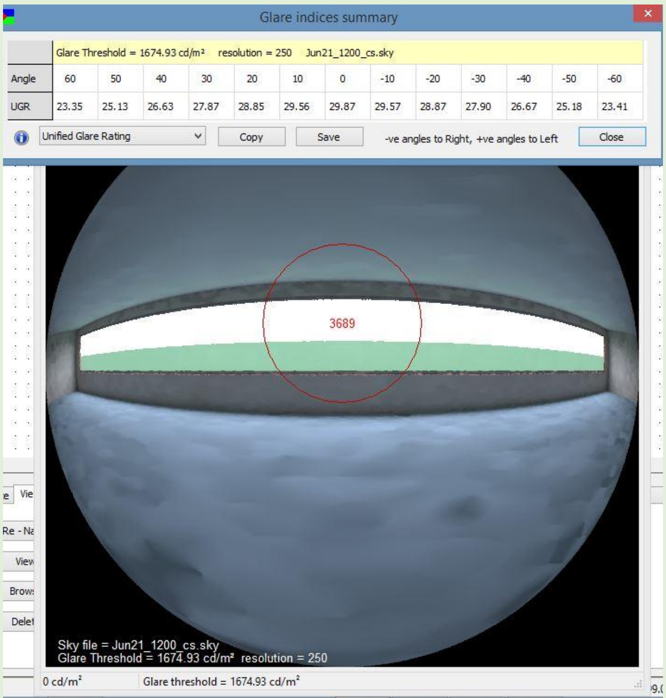
</td></tr>
<tr><td>

CGI



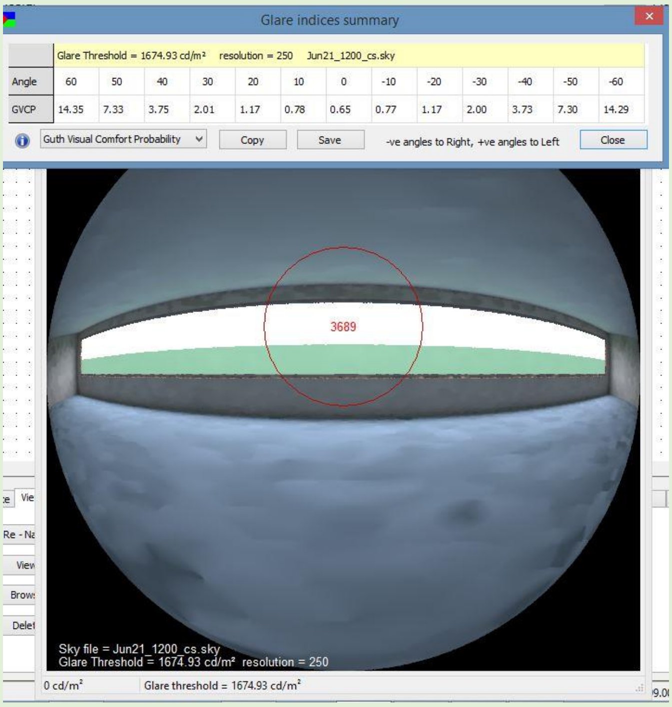
</td><td>

UGR

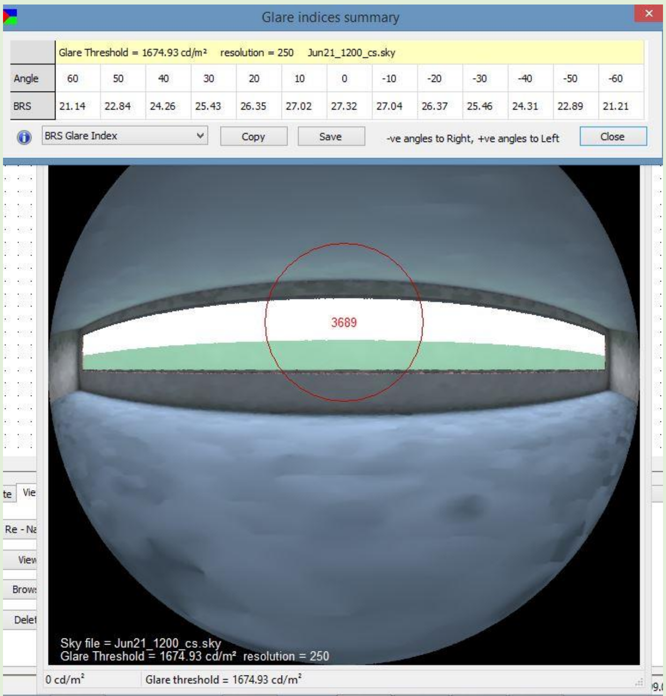


</td></tr>
</table>

VCP


Glare indices summary
Glare Threshold = 1674.93 cd/m² resolution = 250 Jun21_1200_cs.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 14.35 7.33 3.75 2.01 1.17 0.78 0.65 0.77 1.17 2.00 3.73 7.30 14.29
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3689
Sky file = Jun21_1200_cs.sky
Glare Threshold = 1674.93 cd/m² resolution = 250
0 cd/m²
Glare threshold = 1674.93 cd/m²

BRS


Glare indices summary
Glare Threshold = 1674.93 cd/m² resolution = 250 Jun21_1200_cs.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 21.14 22.84 24.26 25.43 26.35 27.02 27.32 27.04 26.37 25.46 24.31 22.89 21.21
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3689
Sky file = Jun21_1200_cs.sky
Glare Threshold = 1674.93 cd/m² resolution = 250
0 cd/m²
Glare threshold = 1674.93 cd/m²

GDGR

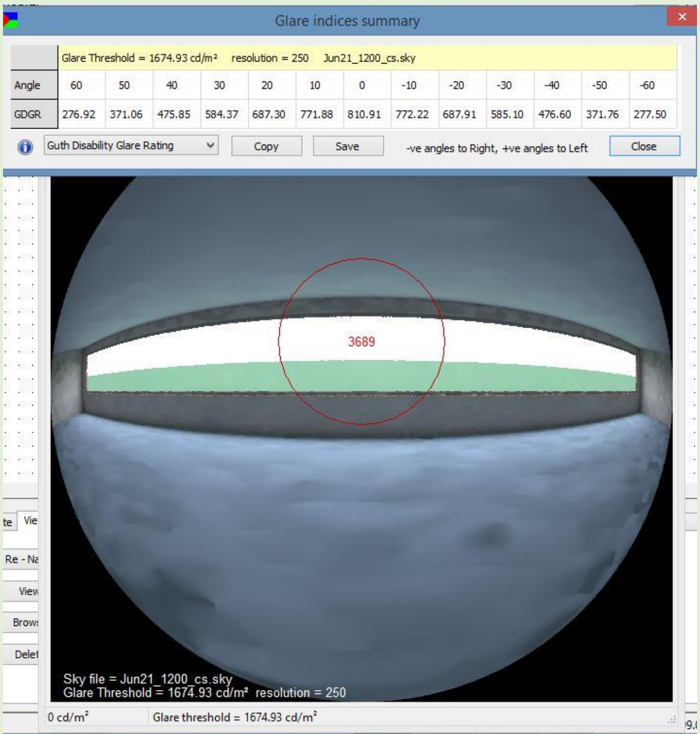
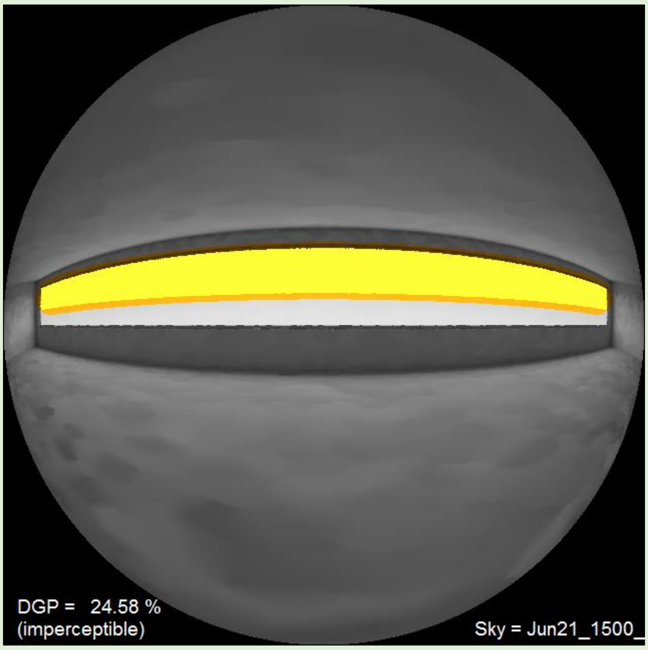

Glare indices summary
Glare Threshold = 1674.93 cd/m² resolution = 250 Jun21_1200_cs.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 276.92 371.06 475.85 584.37 687.30 771.88 810.91 772.22 687.91 585.10 476.60 371.76 277.50
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3689
Sky file = Jun21_1200_cs.sky
Glare Threshold = 1674.93 cd/m² resolution = 250
0 cd/m²
Glare threshold = 1674.93 cd/m²

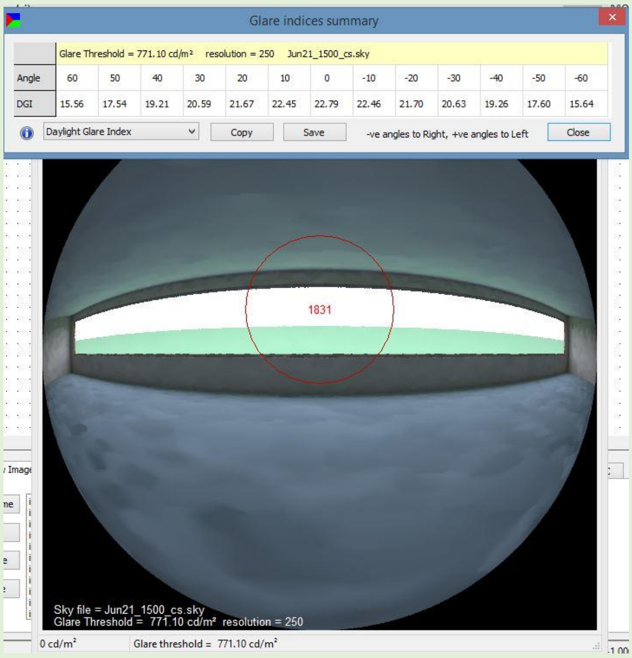
Table 114: Daylight and Glare Analysis for Jun 21, with clear sky, (E), (P4),(T15).

Daylight and Glare Analysis for Jun 21, (clear sky), (E), (P4) (T15).

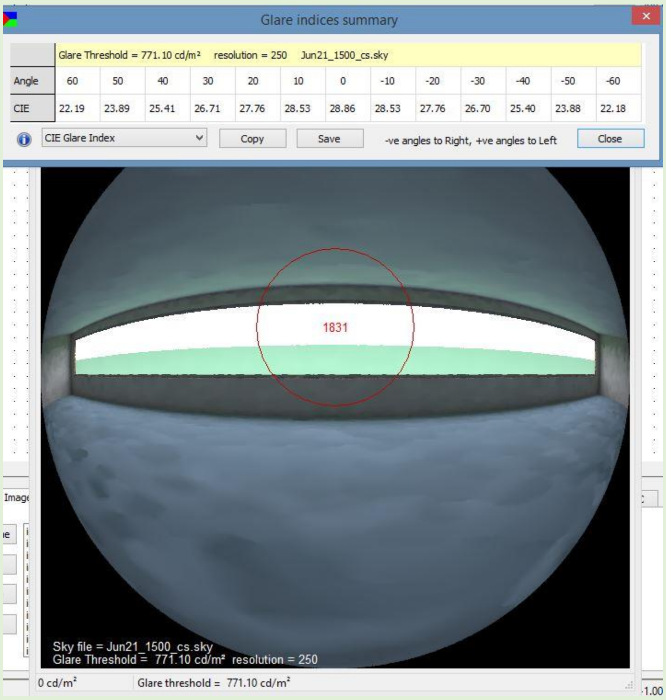
DGP



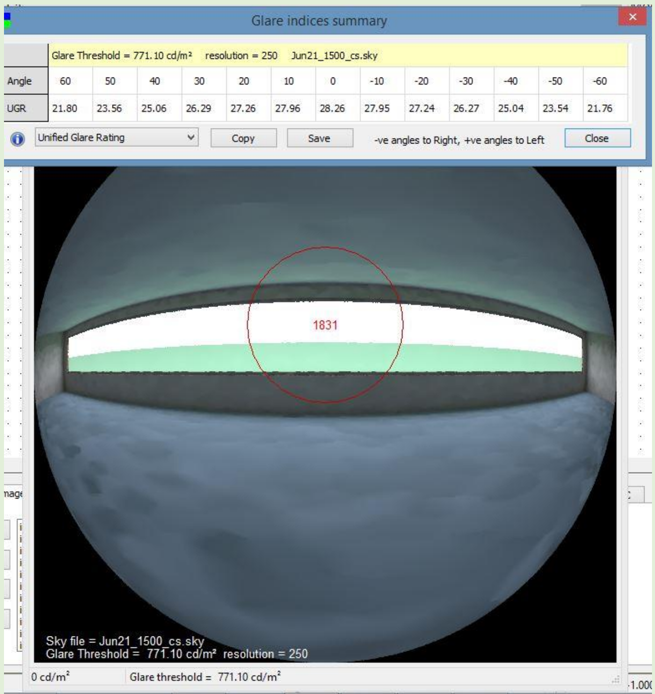
DGI



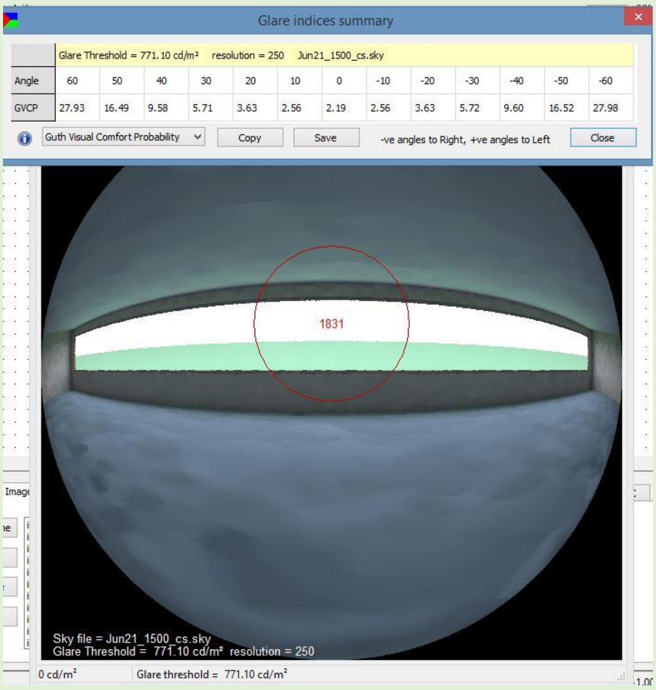
CGI



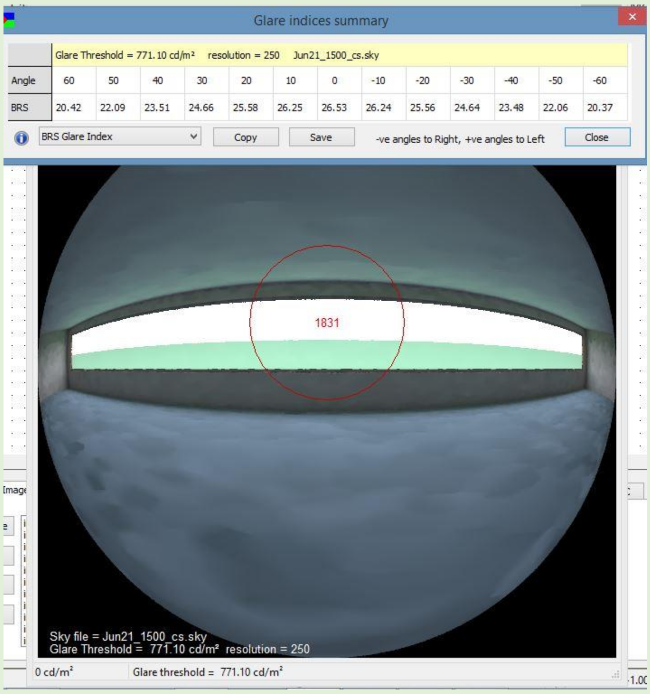
UGR



VCP


Glare indices summary
Glare Threshold = 771.10 cd/m² resolution = 250 Jun21_1500_cs.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 27.93 16.49 9.58 5.71 3.63 2.56 2.19 2.56 3.63 5.72 9.60 16.52 27.98
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1831
Sky file = Jun21_1500_cs.sky
Glare Threshold = 771.10 cd/m² resolution = 250
0 cd/m²
Glare threshold = 771.10 cd/m²

BRS


Glare indices summary
Glare Threshold = 771.10 cd/m² resolution = 250 Jun21_1500_cs.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 20.42 22.09 23.51 24.66 25.58 26.25 26.53 26.24 25.56 24.64 23.48 22.06 20.37
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1831
Sky file = Jun21_1500_cs.sky
Glare Threshold = 771.10 cd/m² resolution = 250
0 cd/m²
Glare threshold = 771.10 cd/m²

GDGR

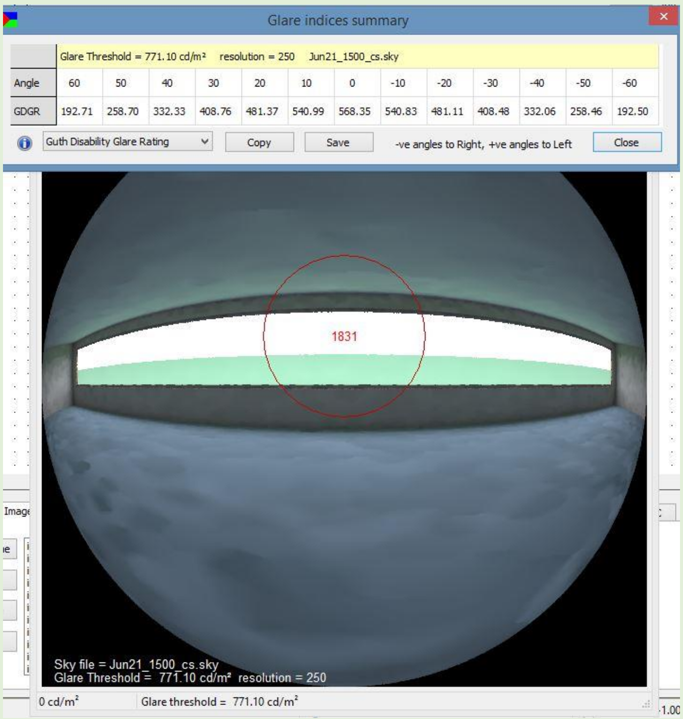
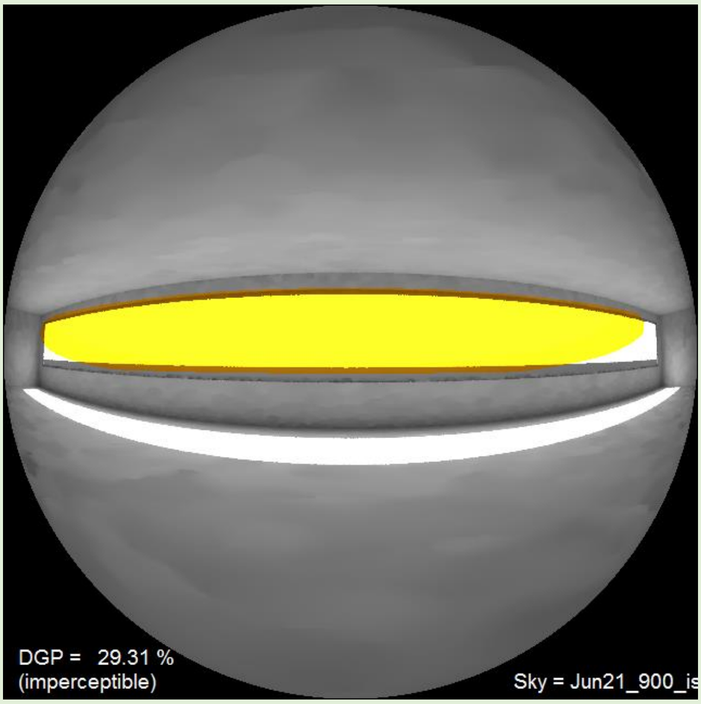

Glare indices summary
Glare Threshold = 771.10 cd/m² resolution = 250 Jun21_1500_cs.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 192.71 258.70 332.33 408.76 481.37 540.99 568.35 540.83 481.11 408.48 332.06 258.46 192.50
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1831
Sky file = Jun21_1500_cs.sky
Glare Threshold = 771.10 cd/m² resolution = 250
0 cd/m²
Glare threshold = 771.10 cd/m²

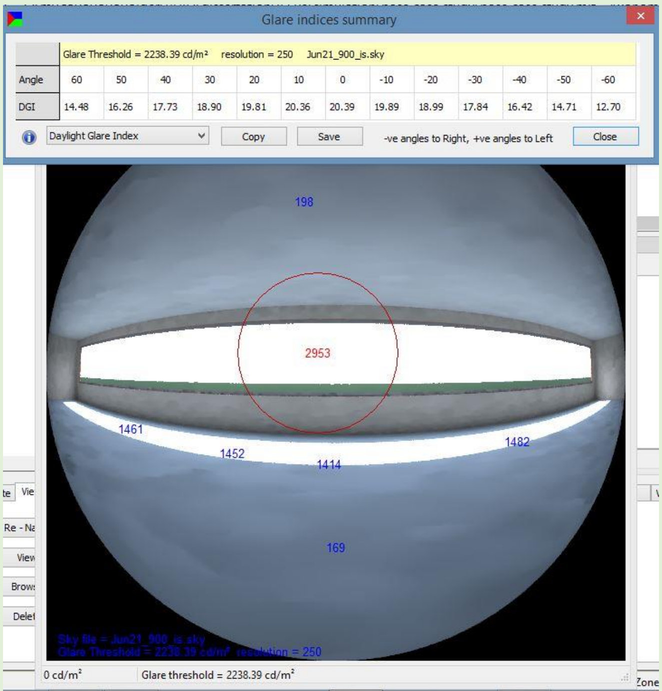
Table 115: Daylight and Glare Analysis for Jun 21, with intermediate sky with sun, (E), (P4),(T9).

Daylight and Glare Analysis for Jun 21, (intermediate sky with sun), (E), (P4) (T9).

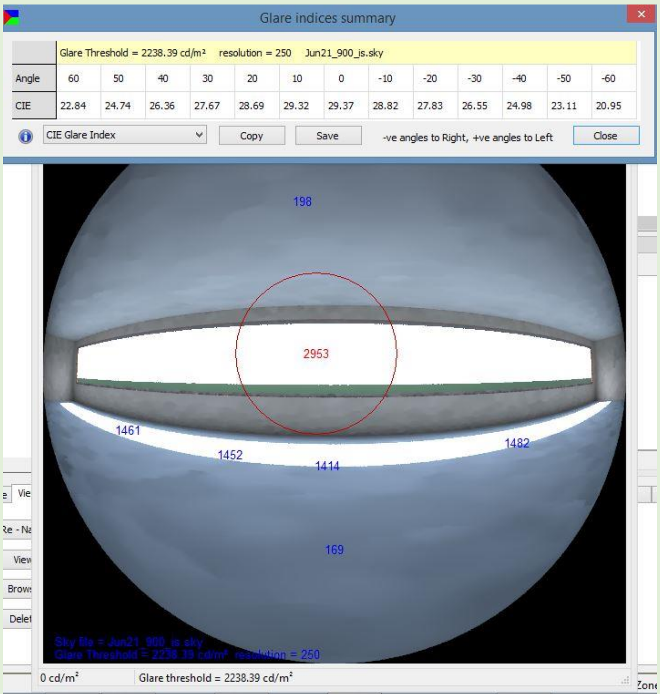
DGP



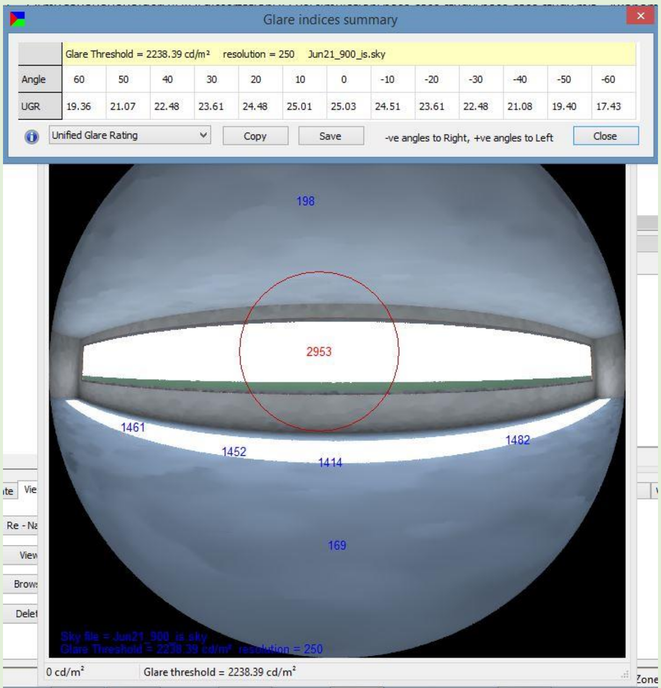
DGI

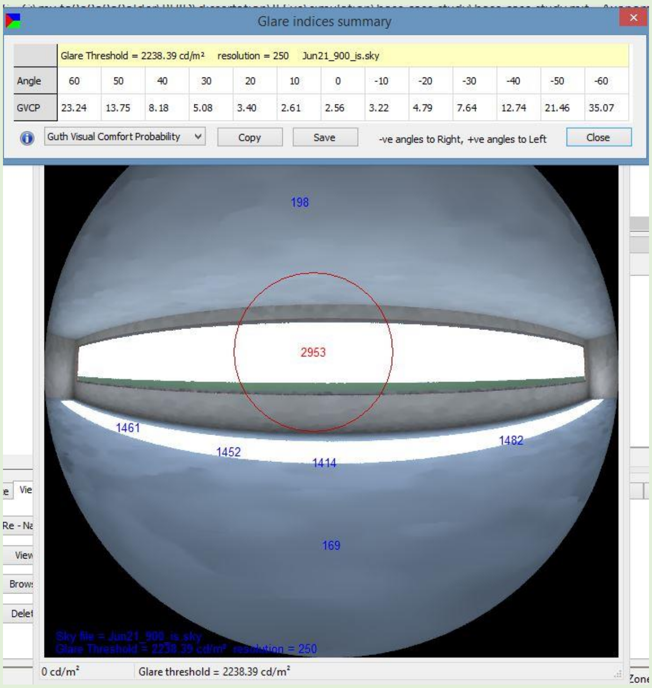
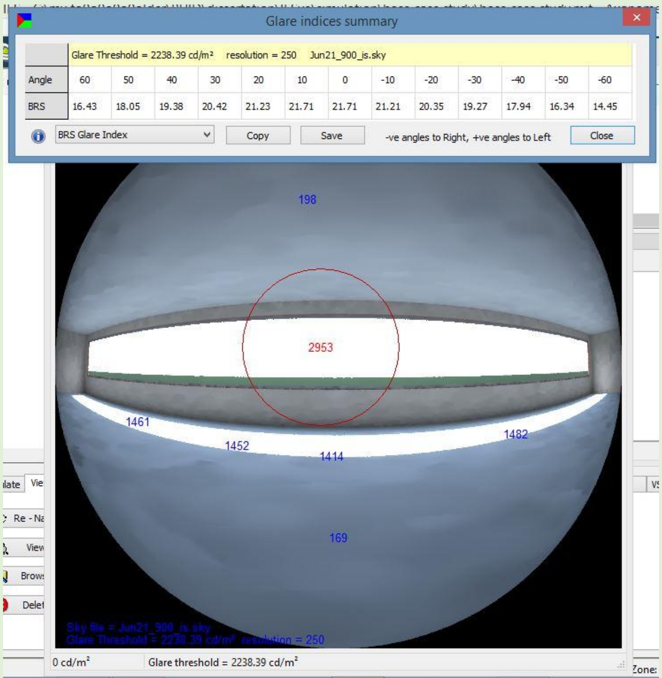


CGI



UGR

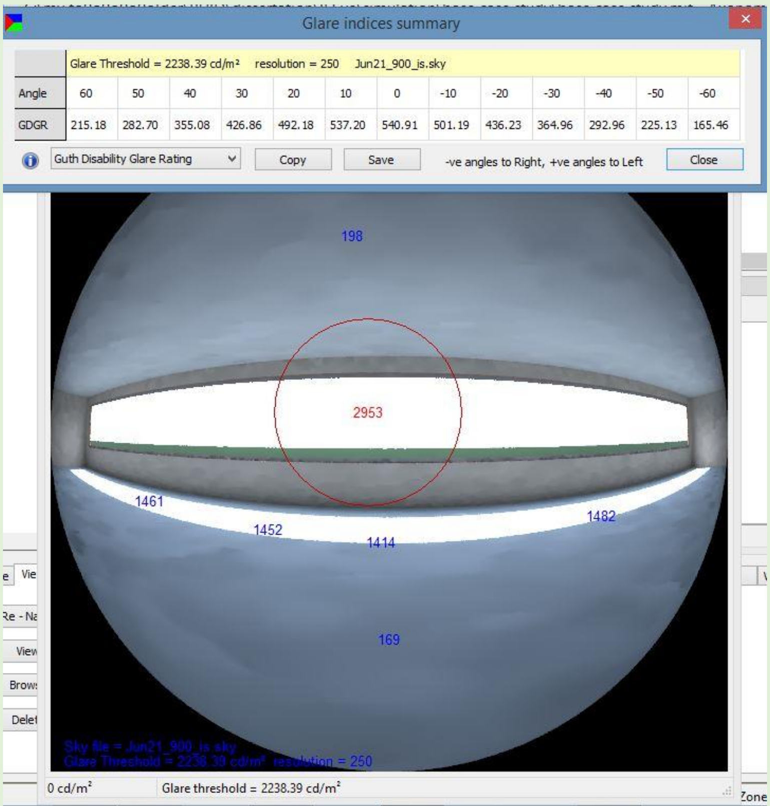


VCP	BRS
	

Glare indices summary
Glare Threshold = 2238.39 cd/m² resolution = 250 Jun21_900_is.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 23.24 13.75 8.18 5.08 3.40 2.61 2.56 3.22 4.79 7.64 12.74 21.46 35.07
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
198
2953
1461
1452
1414
1482
169
0 cd/m²
Glare threshold = 2238.39 cd/m²

Glare indices summary
Glare Threshold = 2238.39 cd/m² resolution = 250 Jun21_900_is.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 16.43 18.05 19.38 20.42 21.23 21.71 21.71 21.21 20.35 19.27 17.94 16.34 14.45
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
198
2953
1461
1452
1414
1482
169
0 cd/m²
Glare threshold = 2238.39 cd/m²

GDGR

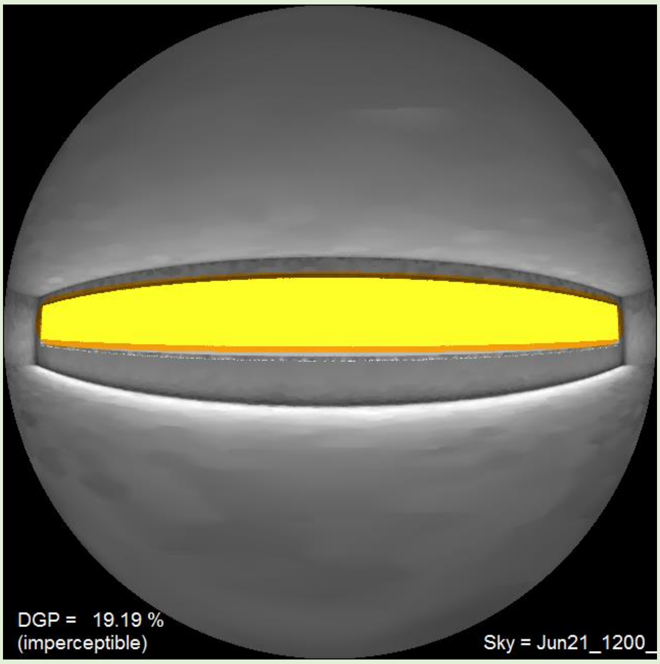


Glare indices summary
Glare Threshold = 2238.39 cd/m² resolution = 250 Jun21_900_is.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 215.18 282.70 355.08 426.86 492.18 537.20 540.91 501.19 436.23 364.96 292.96 225.13 165.46
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
198
2953
1461
1452
1414
1482
169
0 cd/m²
Glare threshold = 2238.39 cd/m²

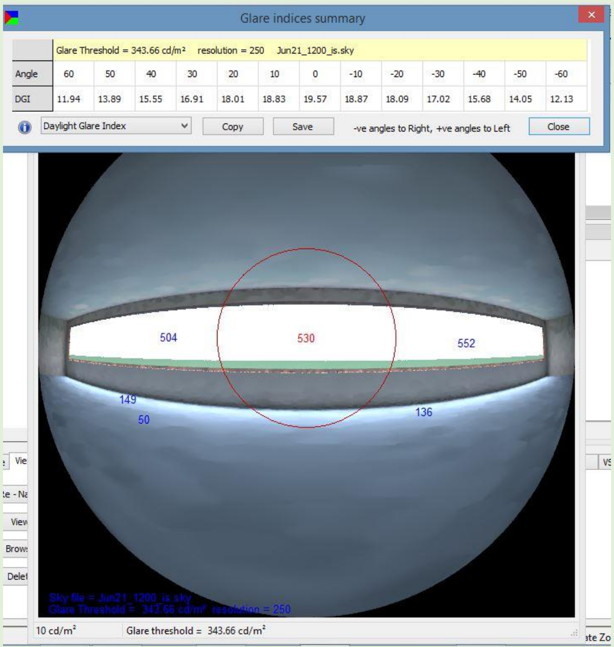
Table 116: Daylight and Glare Analysis for Jun 21, with intermediate sky with sun, (E), (P4),(T12).

Daylight and Glare Analysis for Jun 21, (intermediate sky with sun), (E), (P4) (T12).

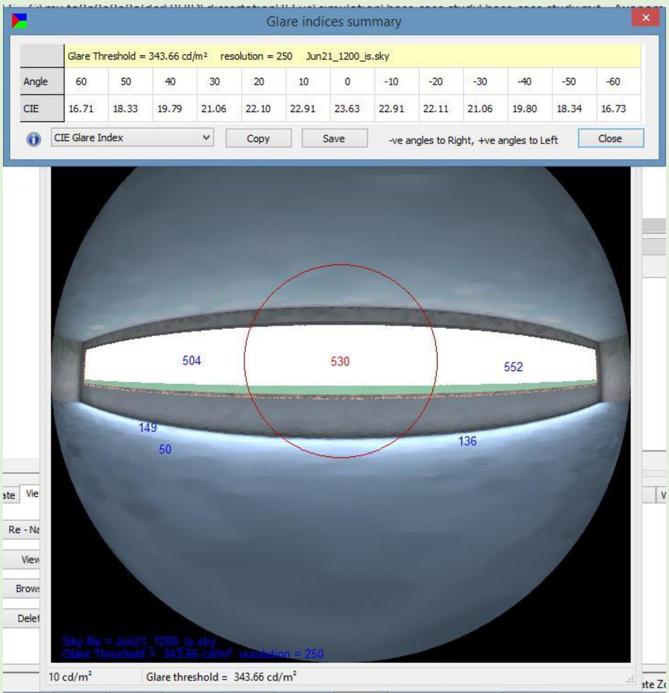
DGP



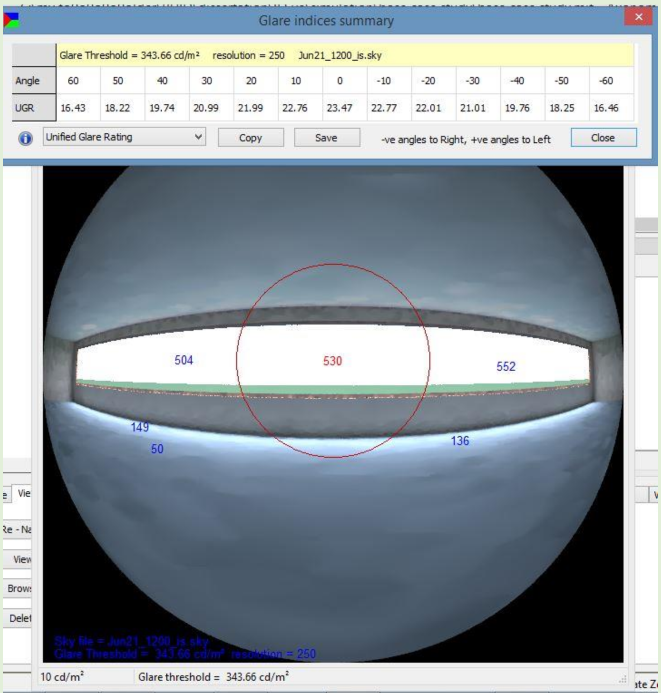
DGI



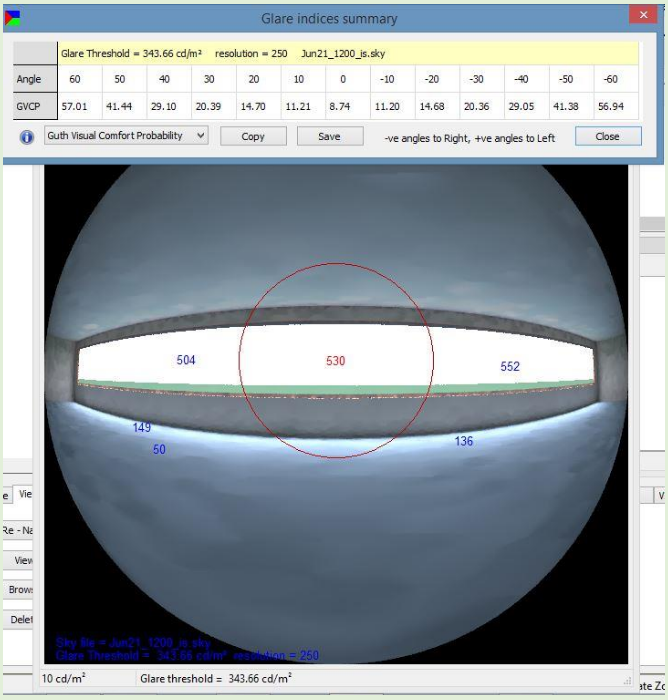
CGI



UGR

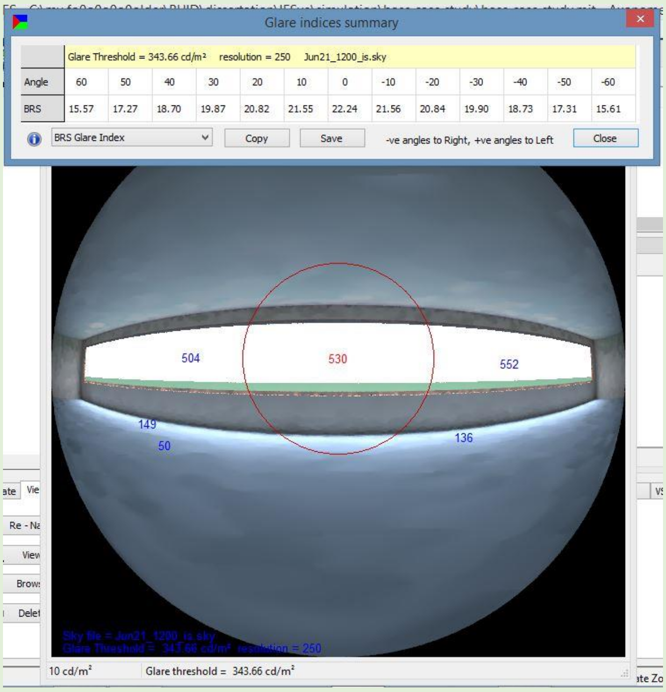


VCP



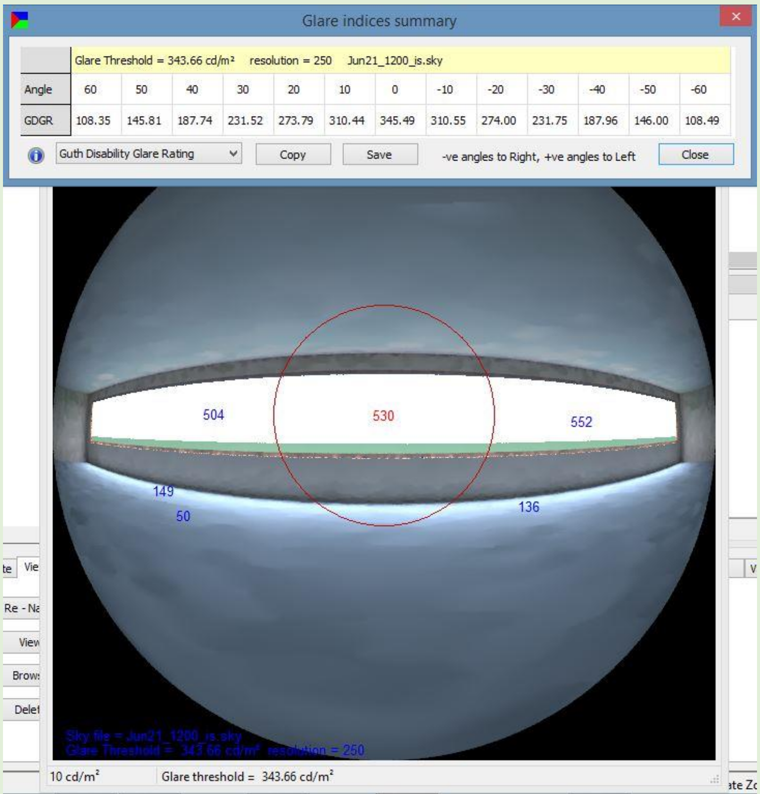
Glare indices summary
Glare Threshold = 343.66 cd/m² resolution = 250 Jun21_1200_is.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 57.01 41.44 29.10 20.39 14.70 11.21 8.74 11.20 14.68 20.36 29.05 41.38 56.94
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
504
530
552
149
50
136
10 cd/m²
Glare threshold = 343.66 cd/m²

BRS



Glare indices summary
Glare Threshold = 343.66 cd/m² resolution = 250 Jun21_1200_is.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 15.57 17.27 18.70 19.87 20.82 21.55 22.24 21.56 20.84 19.90 18.73 17.31 15.61
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
504
530
552
149
50
136
10 cd/m²
Glare threshold = 343.66 cd/m²

GDGR

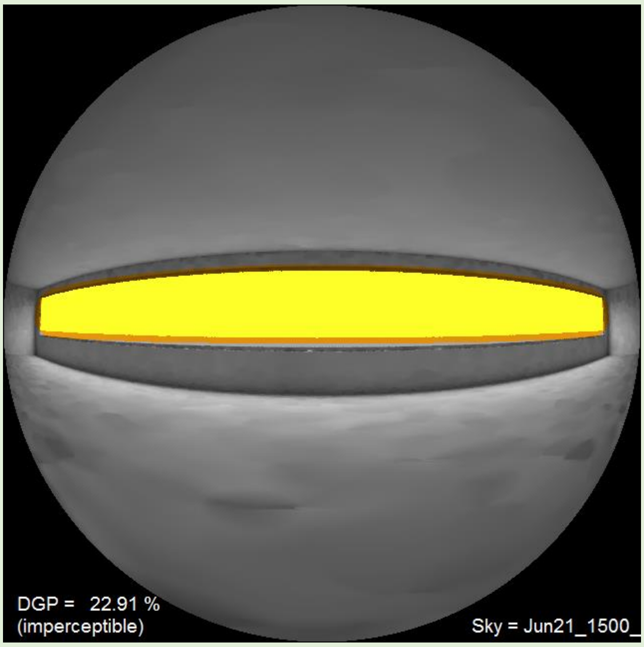


Glare indices summary
Glare Threshold = 343.66 cd/m² resolution = 250 Jun21_1200_is.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 108.35 145.81 187.74 231.52 273.79 310.44 345.49 310.55 274.00 231.75 187.96 146.00 108.49
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
504
530
552
149
50
136
10 cd/m²
Glare threshold = 343.66 cd/m²

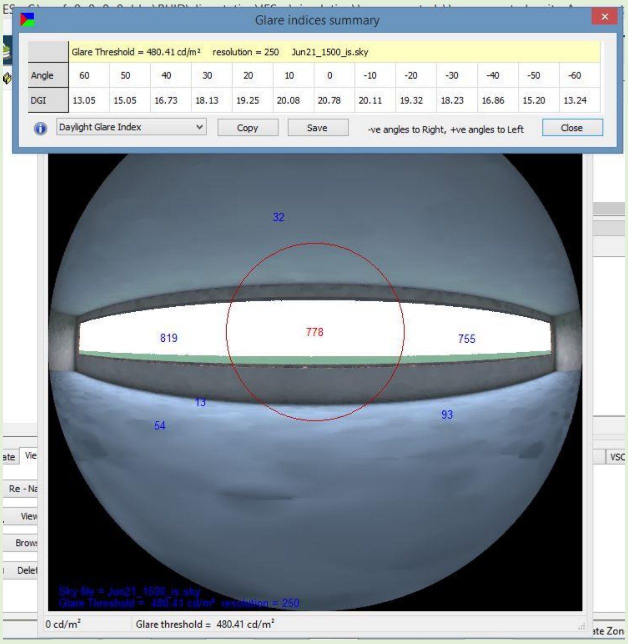
Table 117: Daylight and Glare Analysis for Jun 21, with intermediate sky with sun, (E), (P4),(T15).

Daylight and Glare Analysis for Jun 21, (intermediate sky with sun), (E), (P4) (T15).

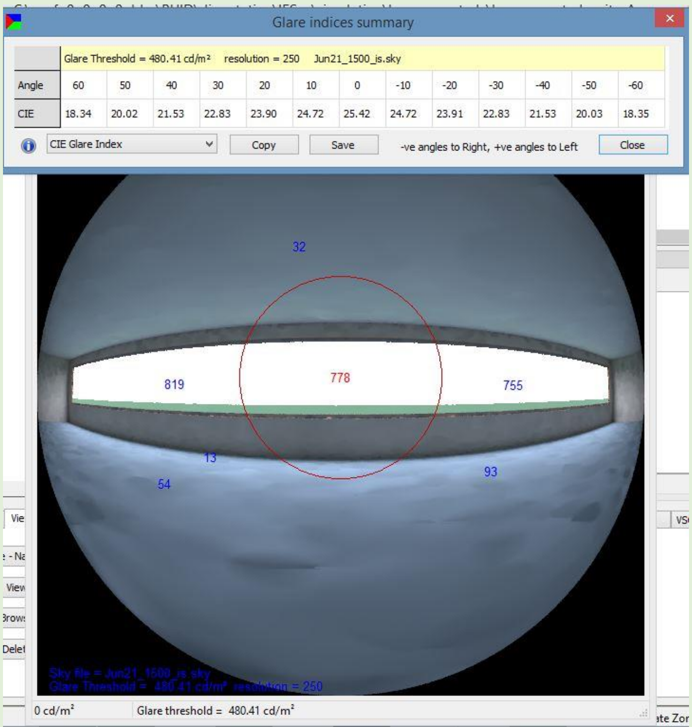
DGP



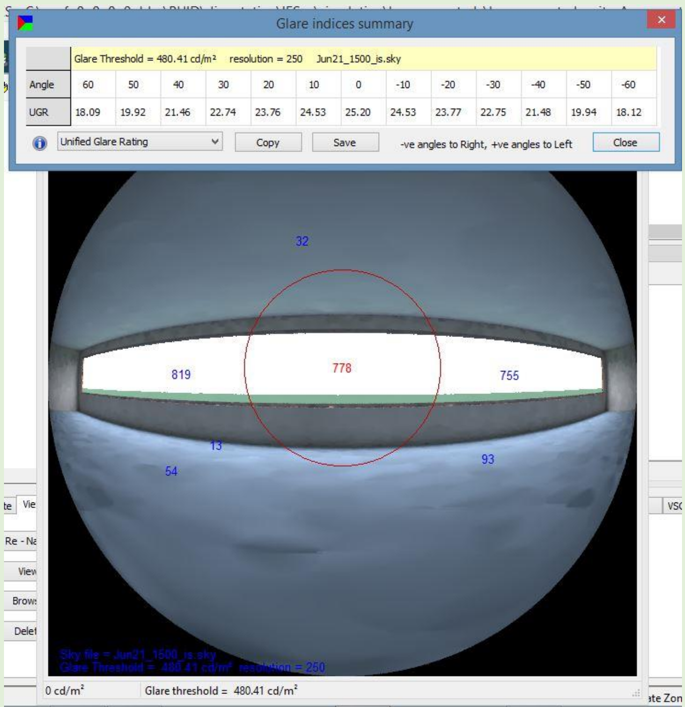
DGI



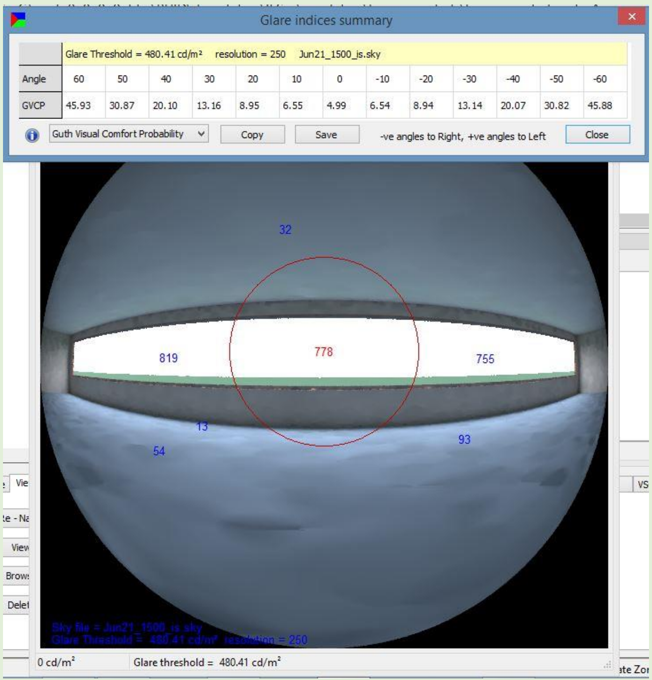
CGI



UGR

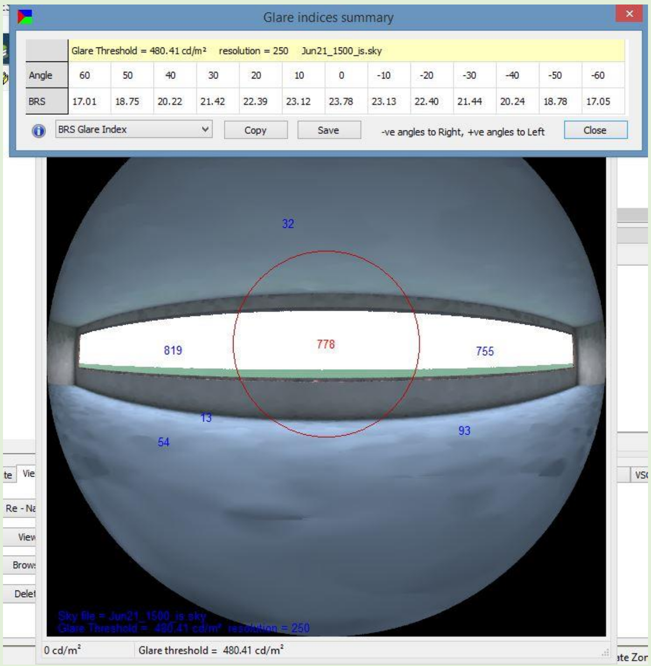


VCP



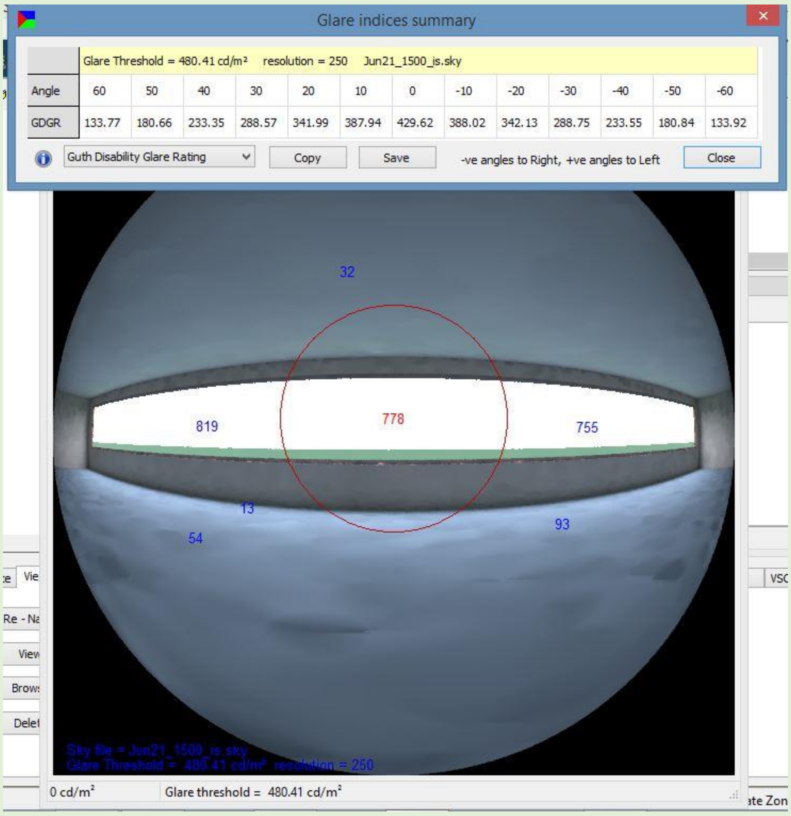
Glare indices summary
Glare Threshold = 480.41 cd/m² resolution = 250 Jun21_1500_js.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 45.93 30.87 20.10 13.16 8.95 6.55 4.99 6.54 8.94 13.14 20.07 30.82 45.88
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
32
819
778
755
13
54
93
0 cd/m²
Glare threshold = 480.41 cd/m²

BRS



Glare indices summary
Glare Threshold = 480.41 cd/m² resolution = 250 Jun21_1500_js.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 17.01 18.75 20.22 21.42 22.39 23.12 23.78 23.13 22.40 21.44 20.24 18.78 17.05
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
32
819
778
755
13
54
93
0 cd/m²
Glare threshold = 480.41 cd/m²

GDGR

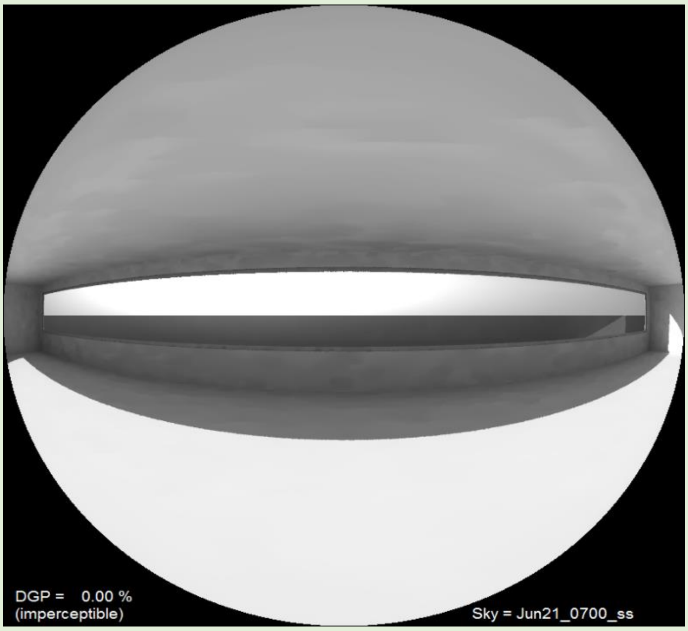


Glare indices summary
Glare Threshold = 480.41 cd/m² resolution = 250 Jun21_1500_js.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 133.77 180.66 233.35 288.57 341.99 387.94 429.62 388.02 342.13 288.75 233.55 180.84 133.92
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
32
819
778
755
13
54
93
0 cd/m²
Glare threshold = 480.41 cd/m²

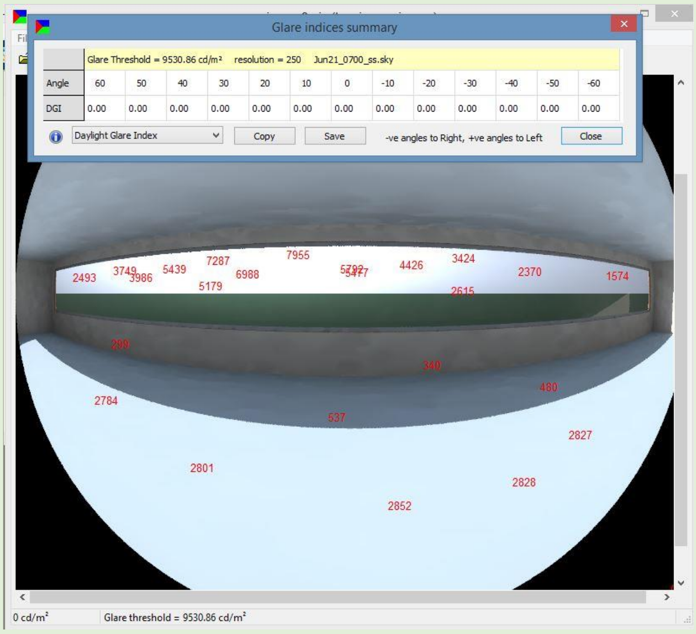
Table 118: *Daylight and Glare Analysis for Jun 21, with sunny sky, (E), (P4),(T7).*

Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P4) (T7).

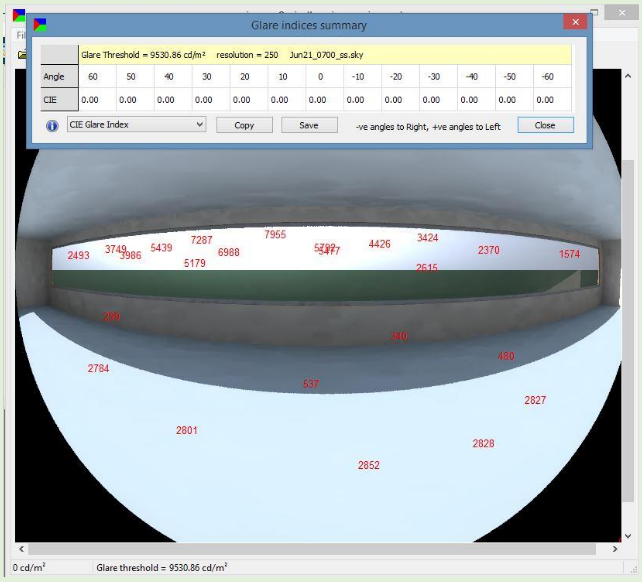
DGP



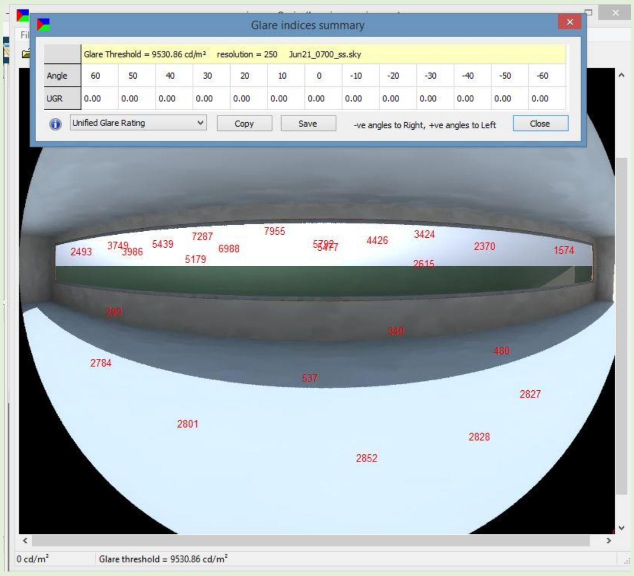
DGI



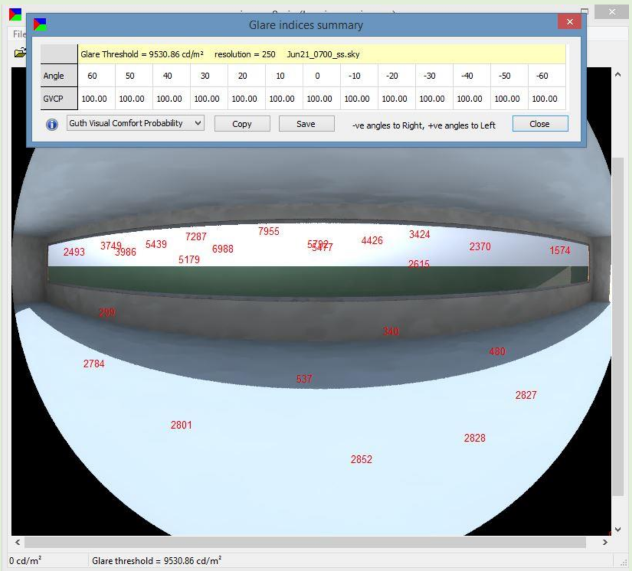
CGI



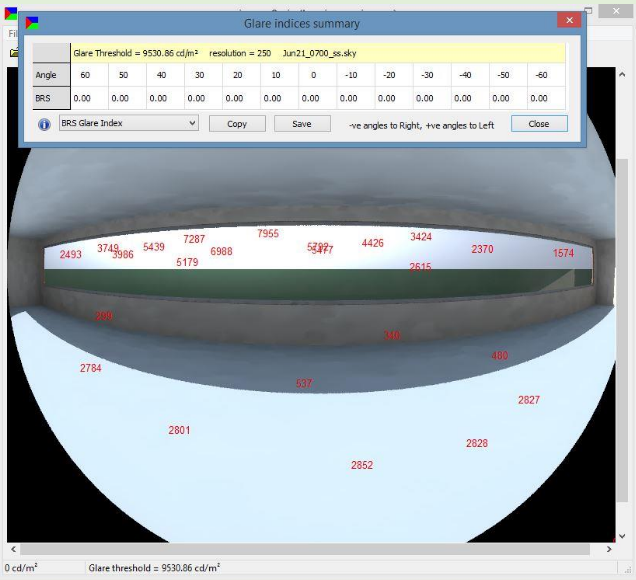
UGR



VCP


Glare indices summary
Glare Threshold = 9530.86 cd/m² resolution = 250 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 100.00 100.00 100.00 100.00 100.00 100.00 100.00 100.00 100.00 100.00 100.00 100.00 100.00
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
0 cd/m²
Glare threshold = 9530.86 cd/m²

BRS


Glare indices summary
Glare Threshold = 9530.86 cd/m² resolution = 250 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
0 cd/m²
Glare threshold = 9530.86 cd/m²

GDGR

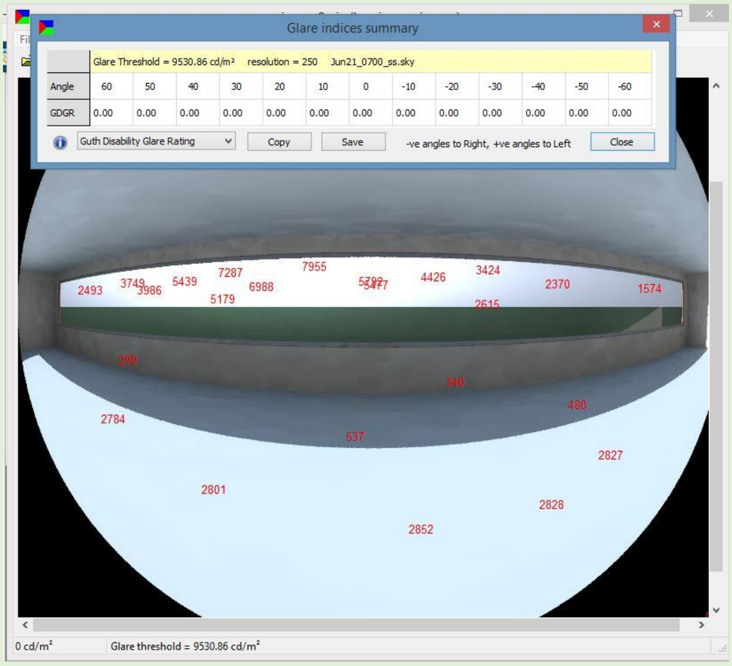
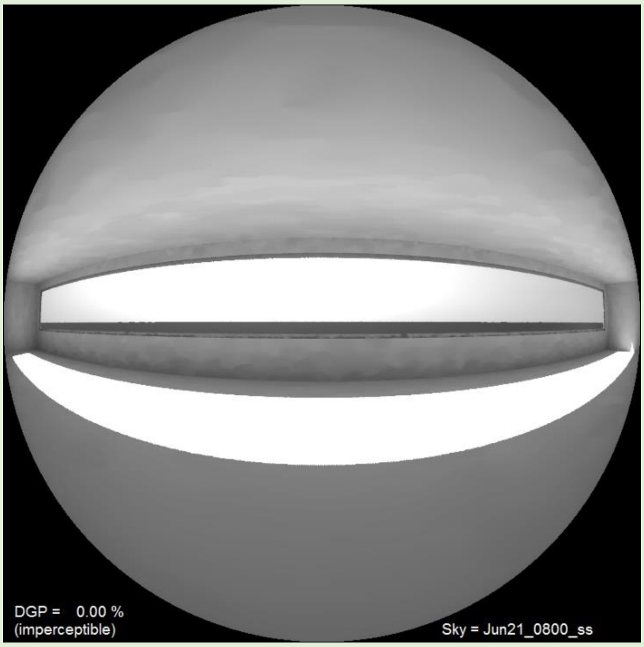

Glare indices summary
Glare Threshold = 9530.86 cd/m² resolution = 250 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
0 cd/m²
Glare threshold = 9530.86 cd/m²

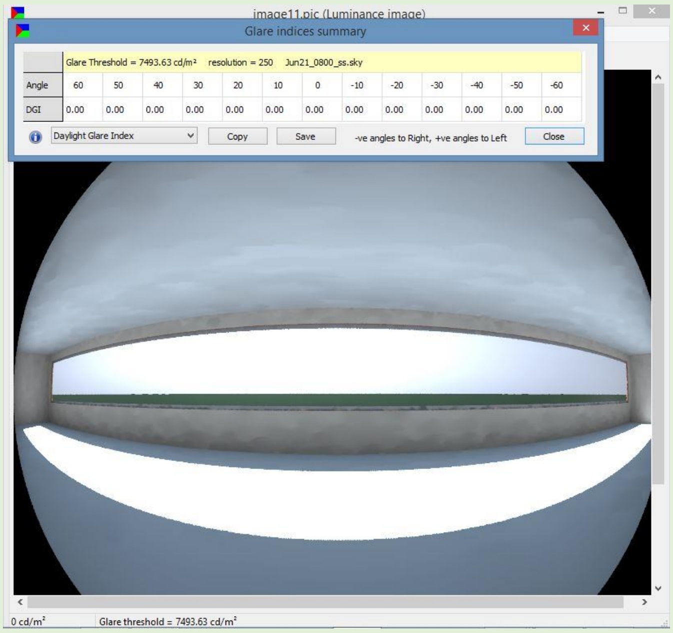
Table 119: Daylight and Glare Analysis for Jun 21, with sunny sky, (E), (P4),(T8).

Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P4) (T8).

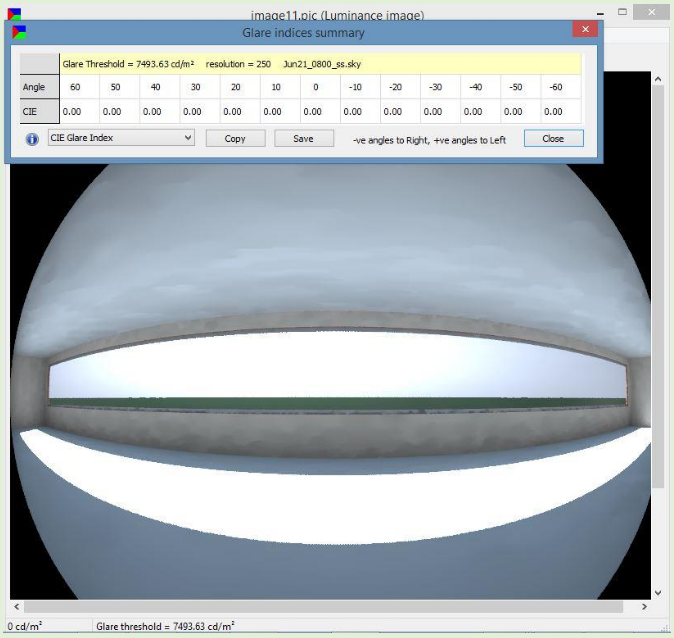
DGP



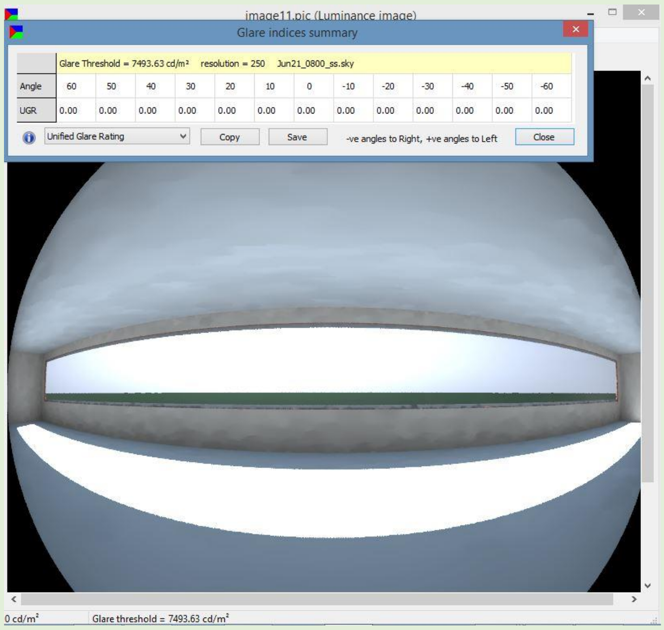
DGI



CGI



UGR



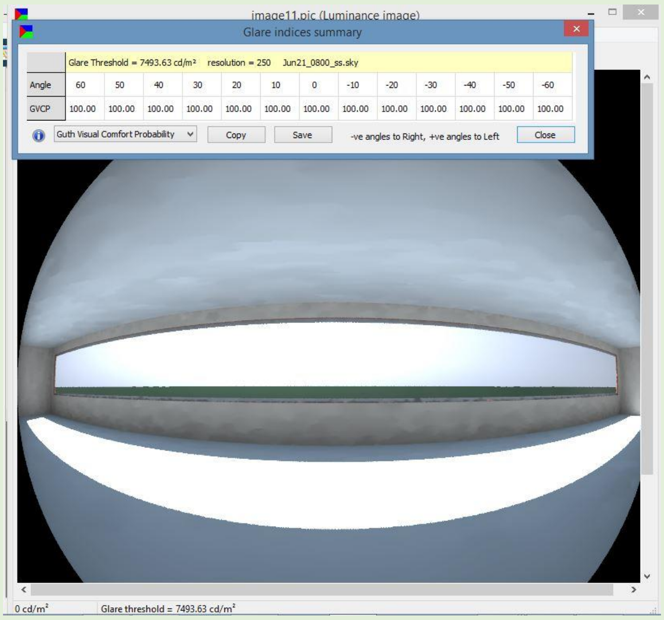
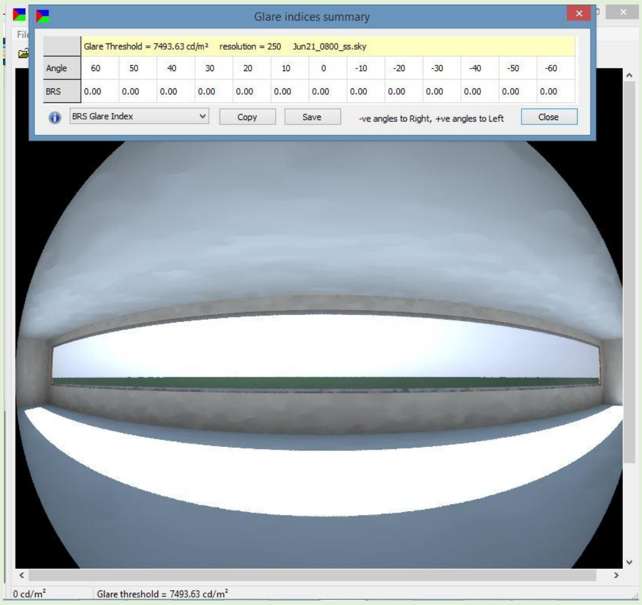
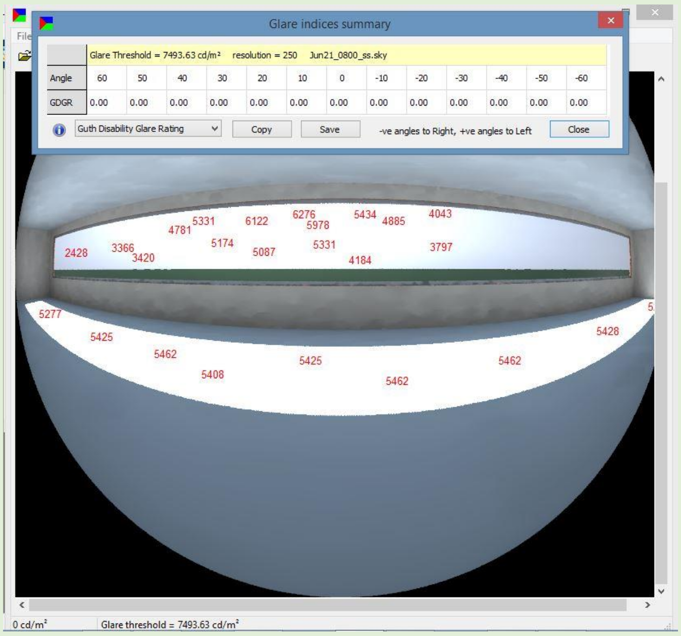
VCP	BRS
	

image11.pic (Luminance image)
Glare indices summary
Glare Threshold = 7493.63 cd/m² resolution = 250 Jun21_0800_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 100.00 100.00 100.00 100.00 100.00 100.00 100.00 100.00 100.00 100.00 100.00 100.00 100.00
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
0 cd/m²
Glare threshold = 7493.63 cd/m²

Glare indices summary
Glare Threshold = 7493.63 cd/m² resolution = 250 Jun21_0800_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
0 cd/m²
Glare threshold = 7493.63 cd/m²

GDGR

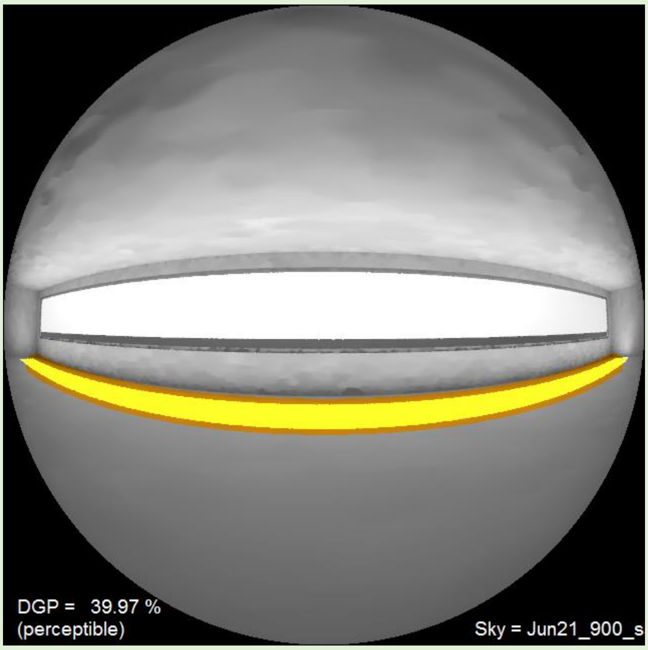


Glare indices summary
Glare Threshold = 7493.63 cd/m² resolution = 250 Jun21_0800_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
5331 6122 6276 5978 5434 4885 4043 4781
2428 3366 3420 5174 5087 5331 4184 3797
5277 5425 5462 5408 5425 5462 5462 5428
0 cd/m²
Glare threshold = 7493.63 cd/m²

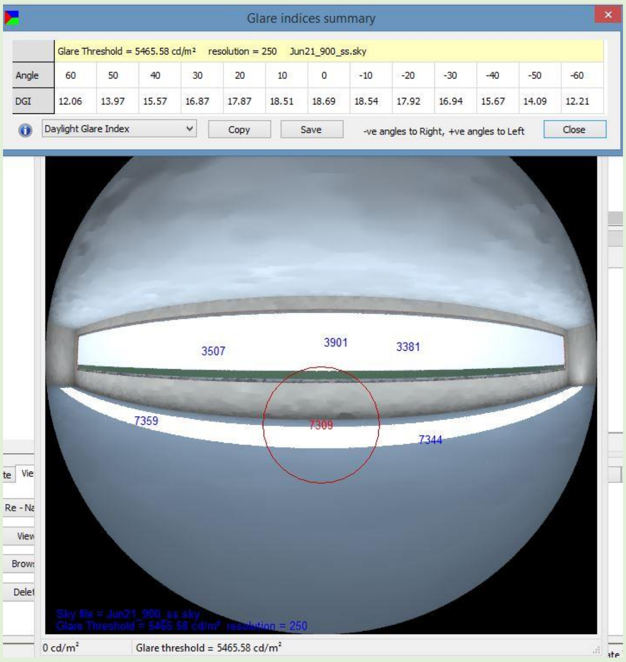
Table 120: Daylight and Glare Analysis for Jun 21, with sunny sky, (E), (P4),(T9).

Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P4) (T9).

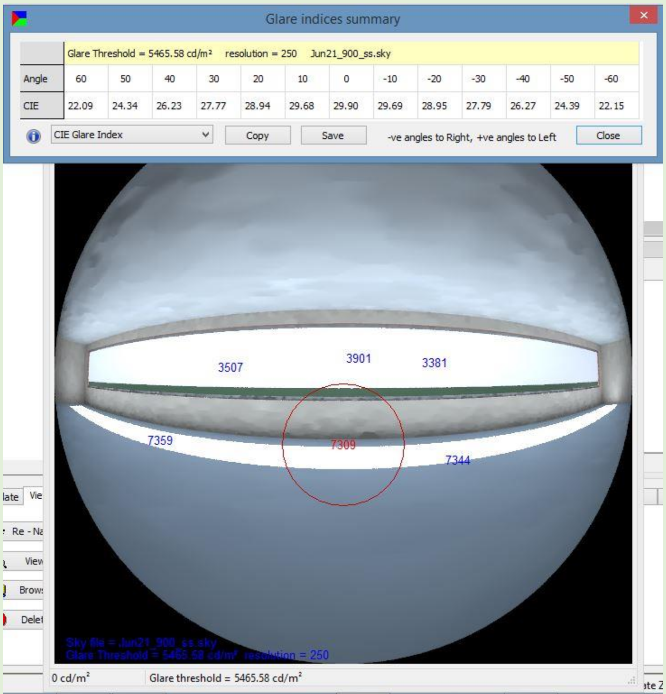
DGP



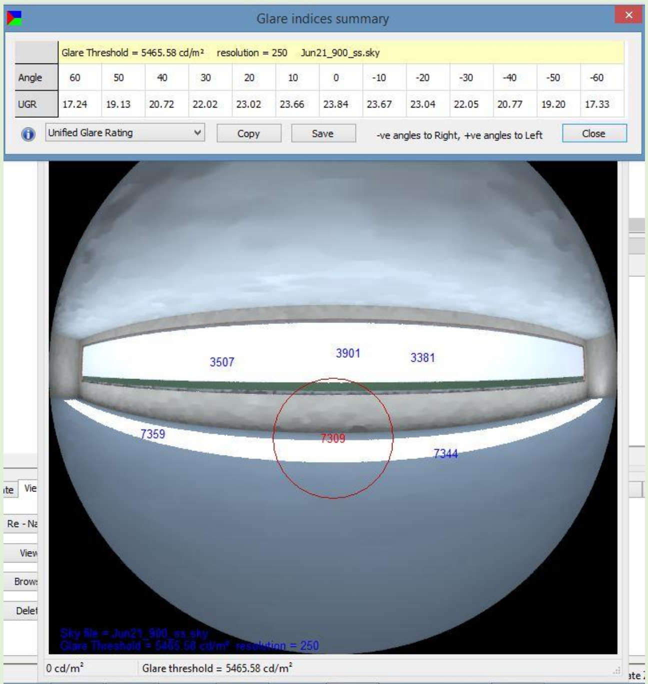
DGI



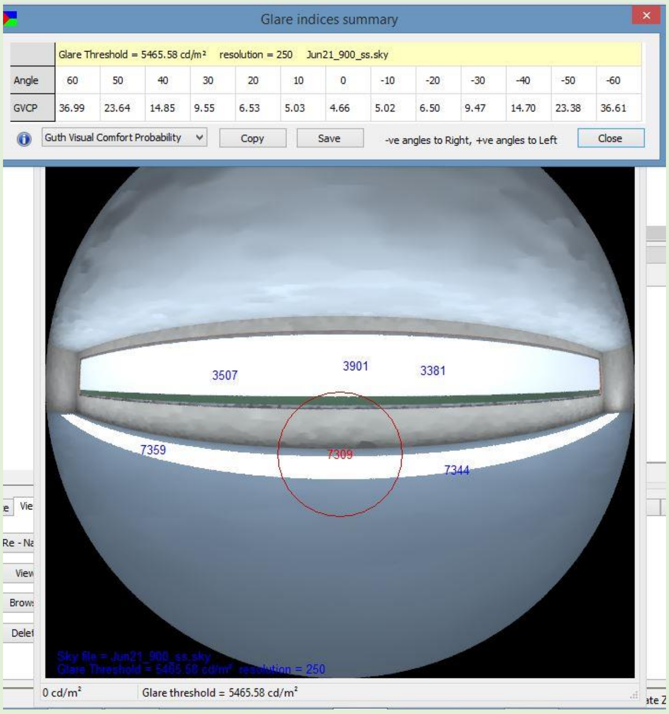
CGI



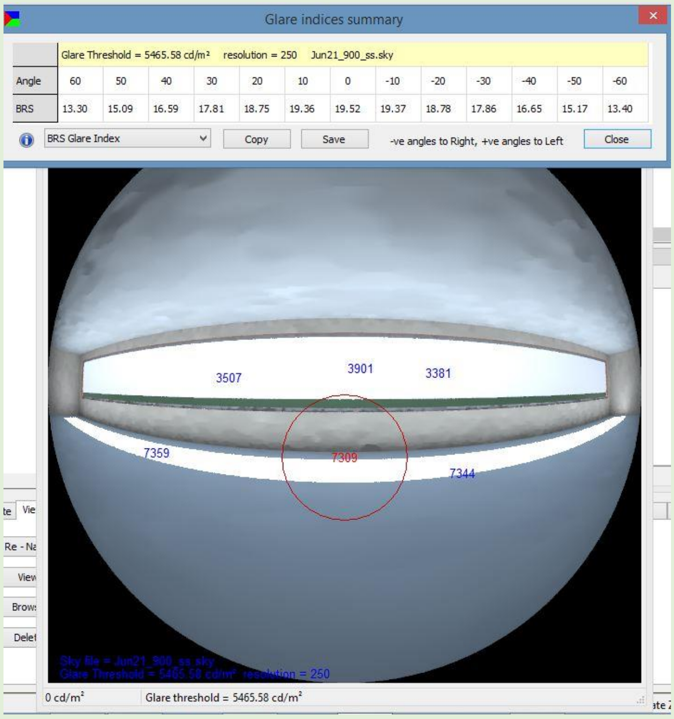
UGR



VCP


Glare indices summary
Glare Threshold = 5465.58 cd/m² resolution = 250 Jun21_900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 36.99 23.64 14.85 9.55 6.53 5.03 4.66 5.02 6.50 9.47 14.70 23.38 36.61
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3507
3901
3381
7359
7309
7344
0 cd/m²
Glare threshold = 5465.58 cd/m²

BRS


Glare indices summary
Glare Threshold = 5465.58 cd/m² resolution = 250 Jun21_900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 13.30 15.09 16.59 17.81 18.75 19.36 19.52 19.37 18.78 17.86 16.65 15.17 13.40
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3507
3901
3381
7359
7309
7344
0 cd/m²
Glare threshold = 5465.58 cd/m²

GDGR

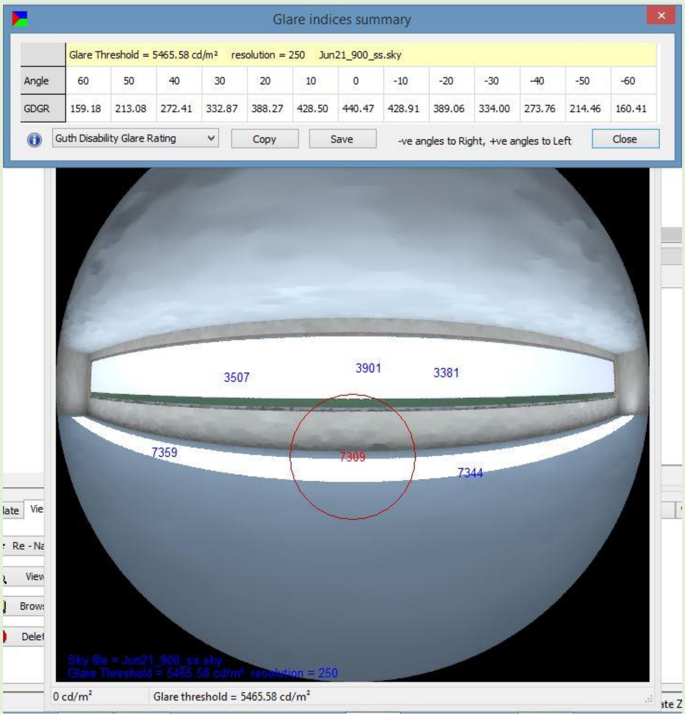
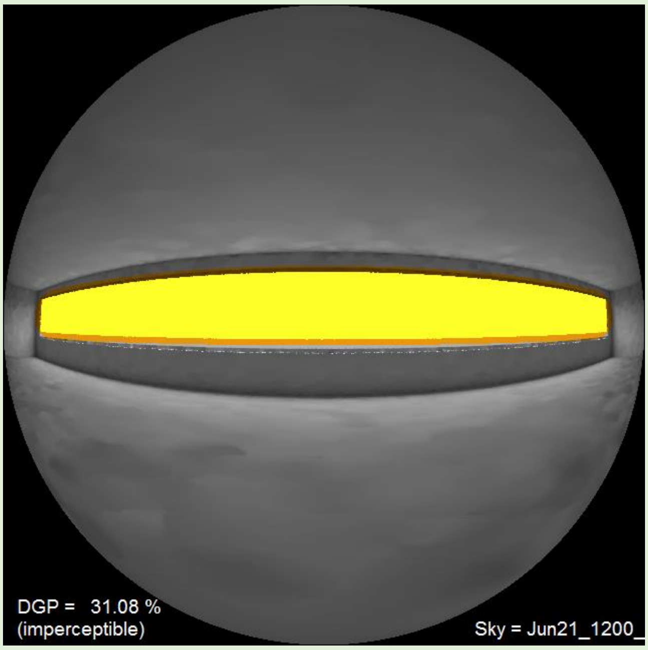

Glare indices summary
Glare Threshold = 5465.58 cd/m² resolution = 250 Jun21_900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 159.18 213.08 272.41 332.87 388.27 428.50 440.47 428.91 389.06 334.00 273.76 214.46 160.41
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3507
3901
3381
7359
7309
7344
0 cd/m²
Glare threshold = 5465.58 cd/m²

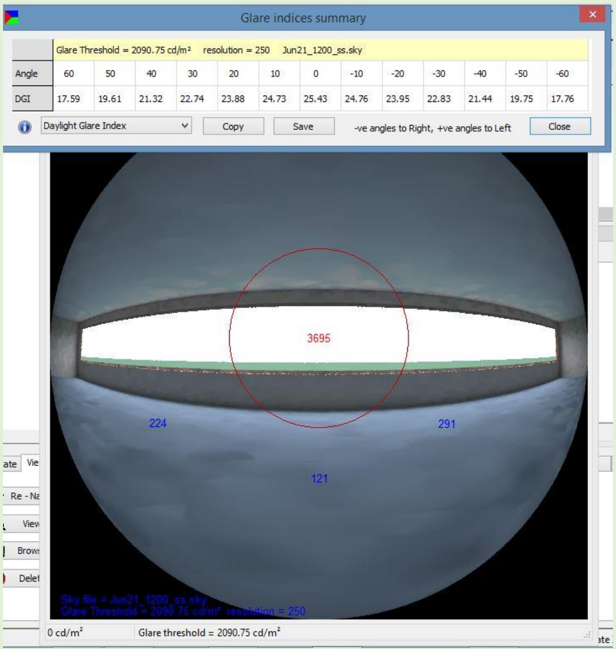
Table 121: Daylight and Glare Analysis for Jun 21, with sunny sky, (E), (P4),(T12).

Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P4) (T12).

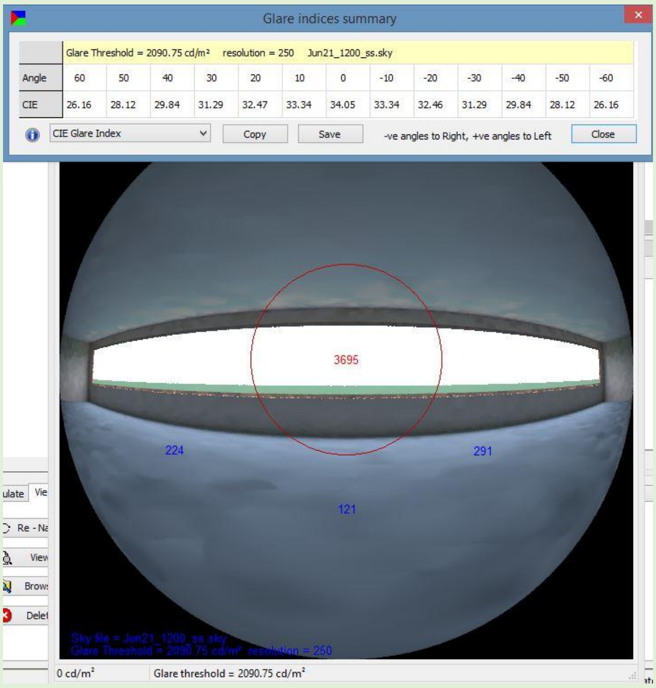
DGP



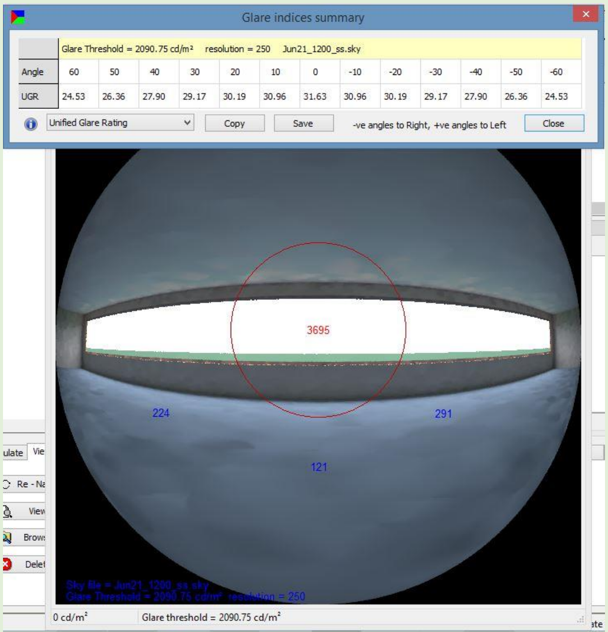
DGI



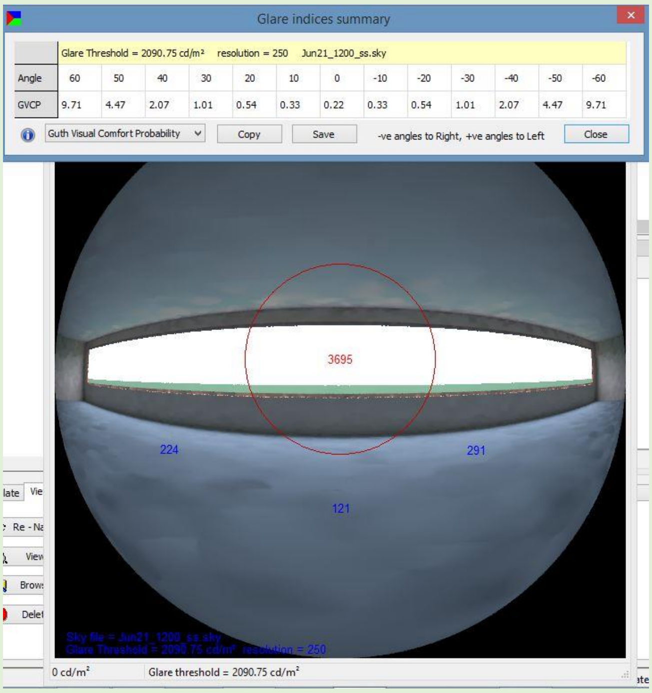
CGI



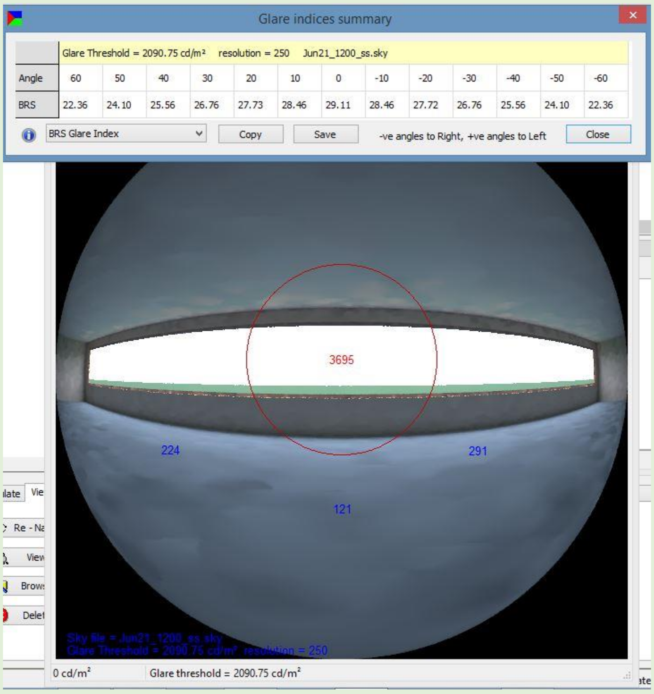
UGR



VCP


Glare indices summary
Glare Threshold = 2090.75 cd/m² resolution = 250 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 9.71 4.47 2.07 1.01 0.54 0.33 0.22 0.33 0.54 1.01 2.07 4.47 9.71
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3695
224
291
121
0 cd/m²
Glare threshold = 2090.75 cd/m²

BRS


Glare indices summary
Glare Threshold = 2090.75 cd/m² resolution = 250 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 22.36 24.10 25.56 26.76 27.73 28.46 29.11 28.46 27.72 26.76 25.56 24.10 22.36
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3695
224
291
121
0 cd/m²
Glare threshold = 2090.75 cd/m²

GDGR

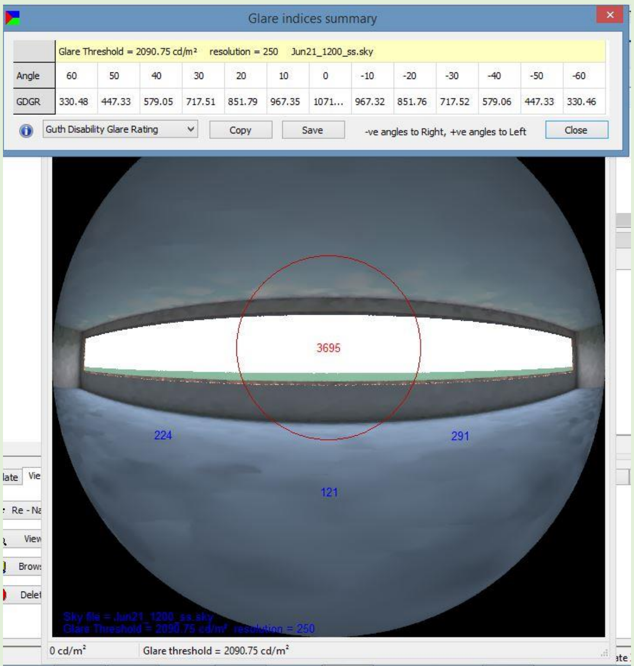
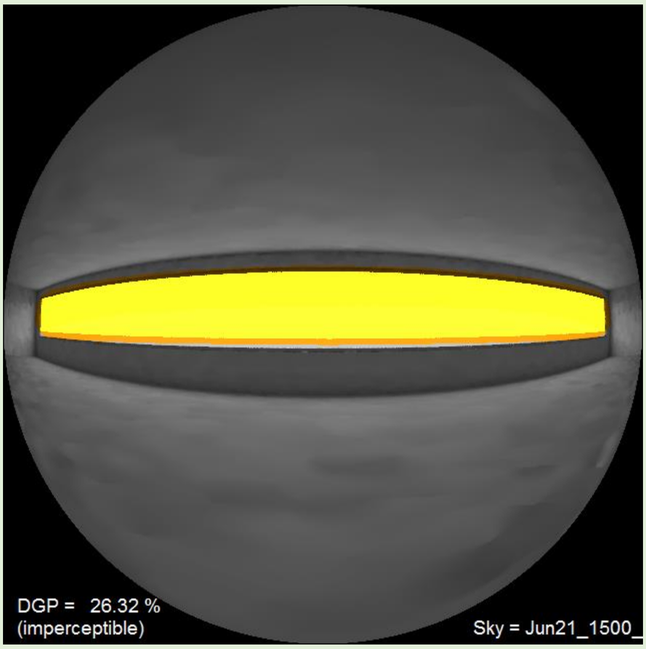

Glare indices summary
Glare Threshold = 2090.75 cd/m² resolution = 250 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 330.48 447.33 579.05 717.51 851.79 967.35 1071... 967.32 851.76 717.52 579.06 447.33 330.46
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3695
224
291
121
0 cd/m²
Glare threshold = 2090.75 cd/m²

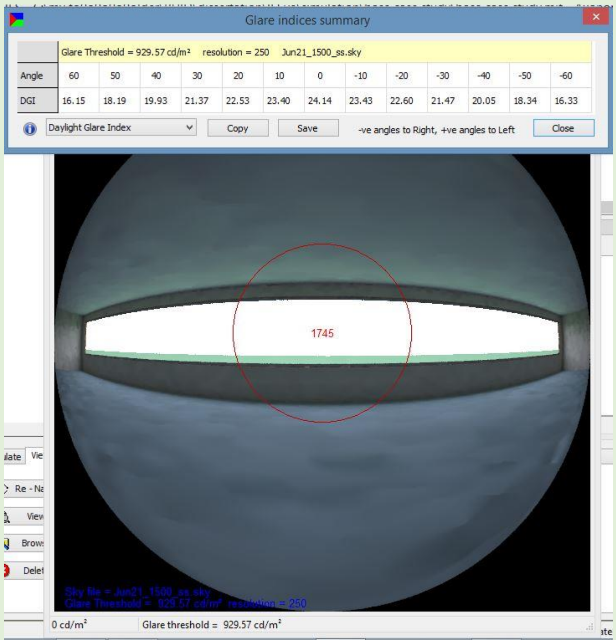
Table 122: Daylight and Glare Analysis for Jun 21, with sunny sky, (E), (P4),(T15).

Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P4) (T15).

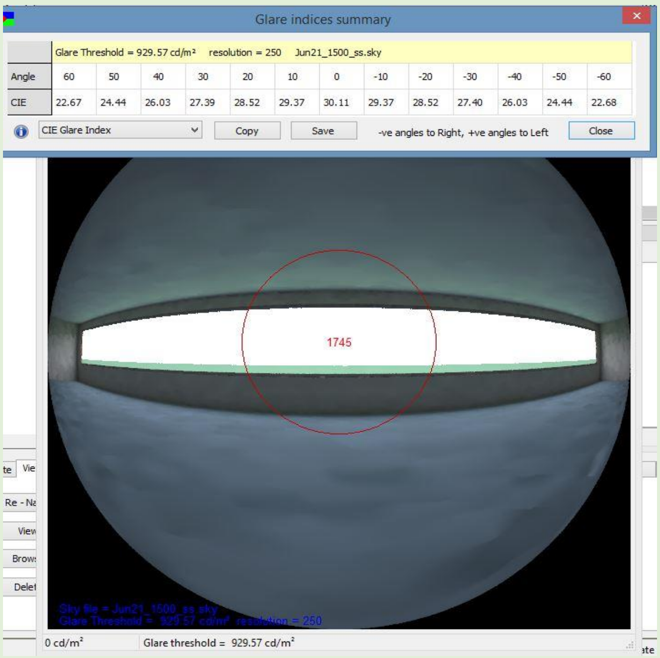
DGP



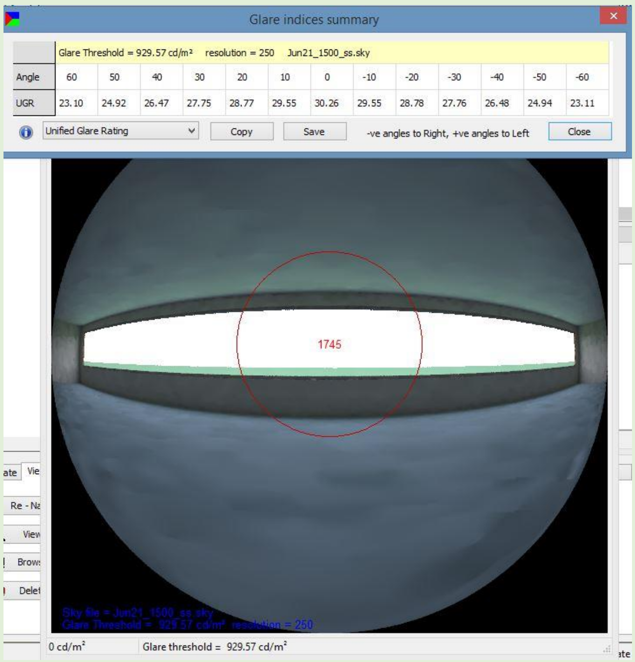
DGI



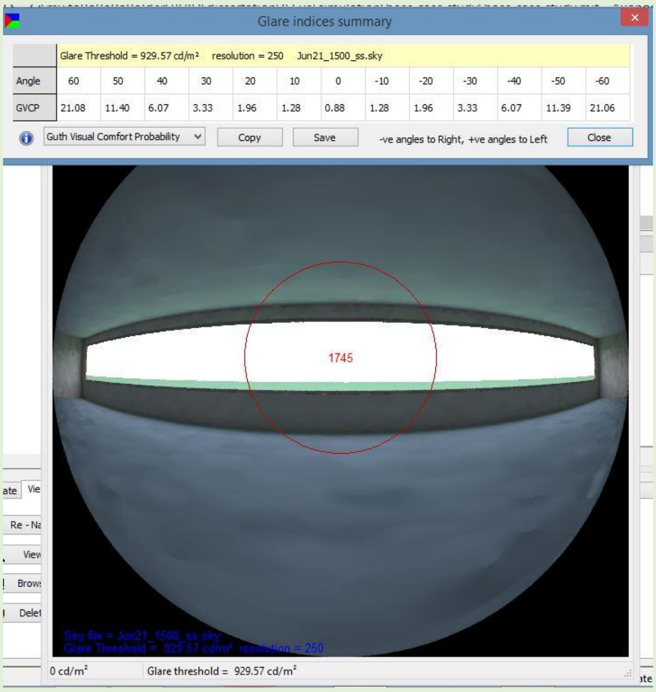
CGI



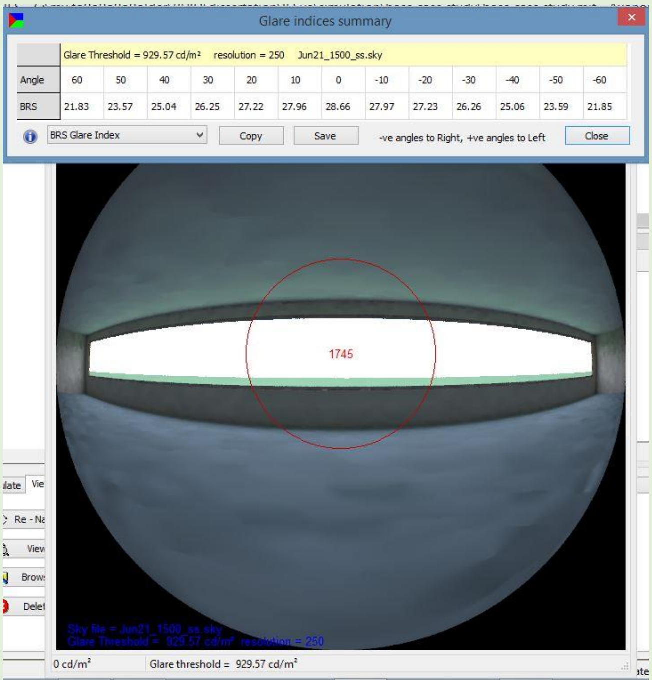
UGR



VCP


Glare indices summary
Glare Threshold = 929.57 cd/m² resolution = 250 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 21.08 11.40 6.07 3.33 1.96 1.28 0.88 1.28 1.96 3.33 6.07 11.39 21.06
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1745
0 cd/m²
Glare threshold = 929.57 cd/m²

BRS


Glare indices summary
Glare Threshold = 929.57 cd/m² resolution = 250 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 21.83 23.57 25.04 26.25 27.22 27.96 28.66 27.97 27.23 26.26 25.06 23.59 21.85
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1745
0 cd/m²
Glare threshold = 929.57 cd/m²

GDGR

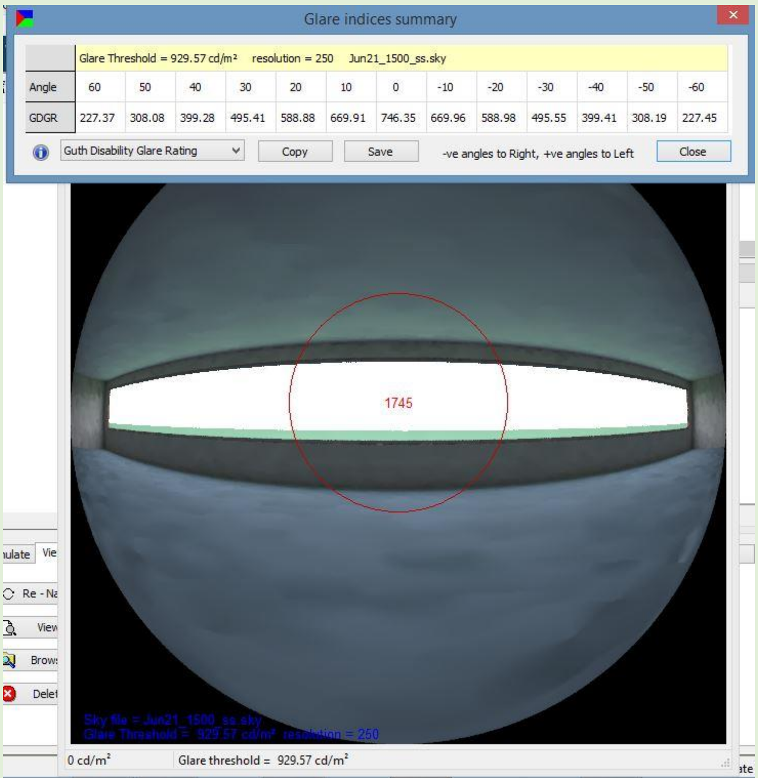
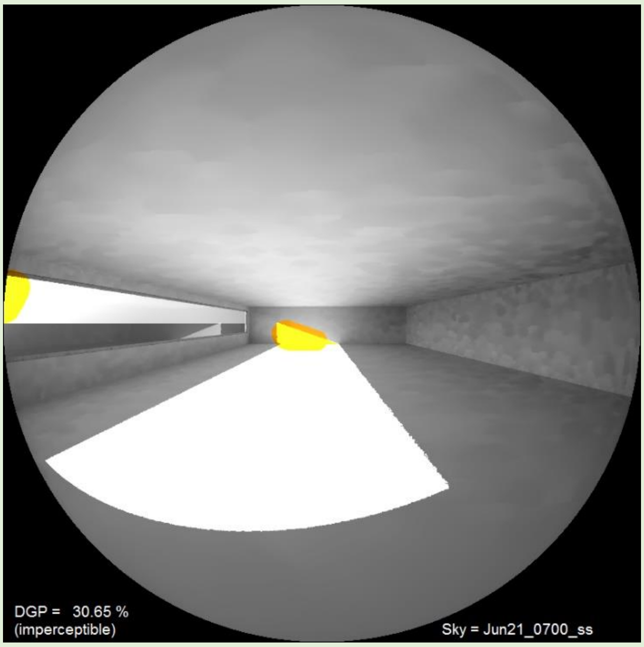

Glare indices summary
Glare Threshold = 929.57 cd/m² resolution = 250 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 227.37 308.08 399.28 495.41 588.88 669.91 746.35 669.96 588.98 495.55 399.41 308.19 227.45
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1745
0 cd/m²
Glare threshold = 929.57 cd/m²

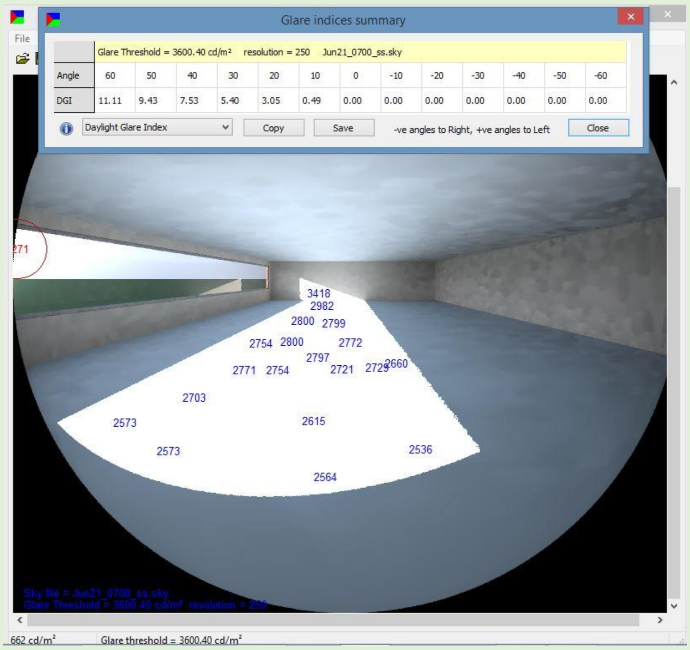
Table 123: Daylight and Glare Analysis for Jun 21, with sunny sky, (E), (P5),(T7).

Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P5) (T7).

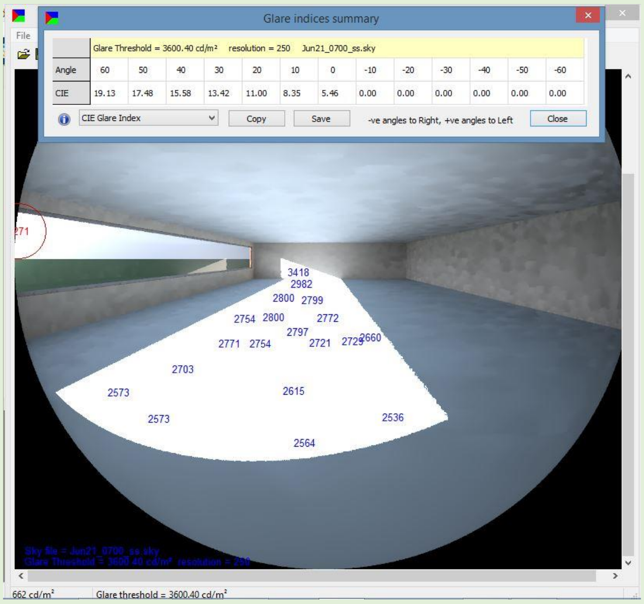
DGP



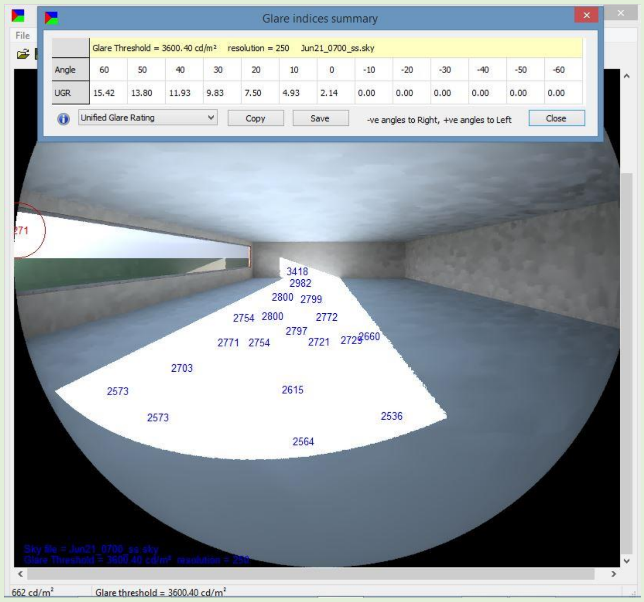
DGI



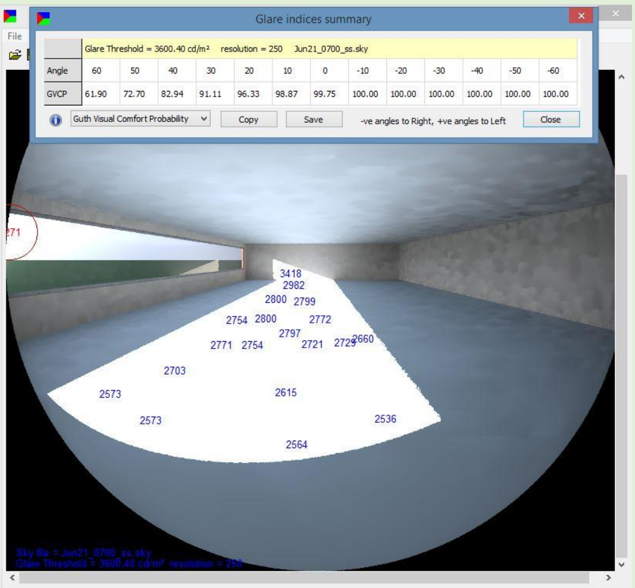
CGI



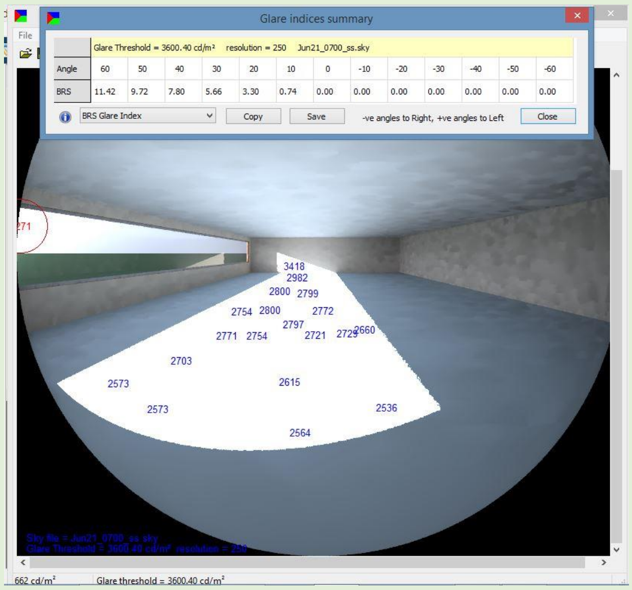
UGR



VCP


Glare indices summary
Glare Threshold = 3600.40 cd/m² resolution = 250 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 61.90 72.70 82.94 91.11 96.33 98.87 99.75 100.00 100.00 100.00 100.00 100.00 100.00
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3418
2982
2800 2799
2754 2800 2772
2797
2771 2754 2721 2729 2660
2703
2573 2615
2573 2536
2564

BRS


Glare indices summary
Glare Threshold = 3600.40 cd/m² resolution = 250 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 11.42 9.72 7.80 5.66 3.30 0.74 0.00 0.00 0.00 0.00 0.00 0.00 0.00
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3418
2982
2800 2799
2754 2800 2772
2797
2771 2754 2721 2729 2660
2703
2573 2615
2573 2536
2564
662 cd/m²
Glare threshold = 3600.40 cd/m²

GDGR

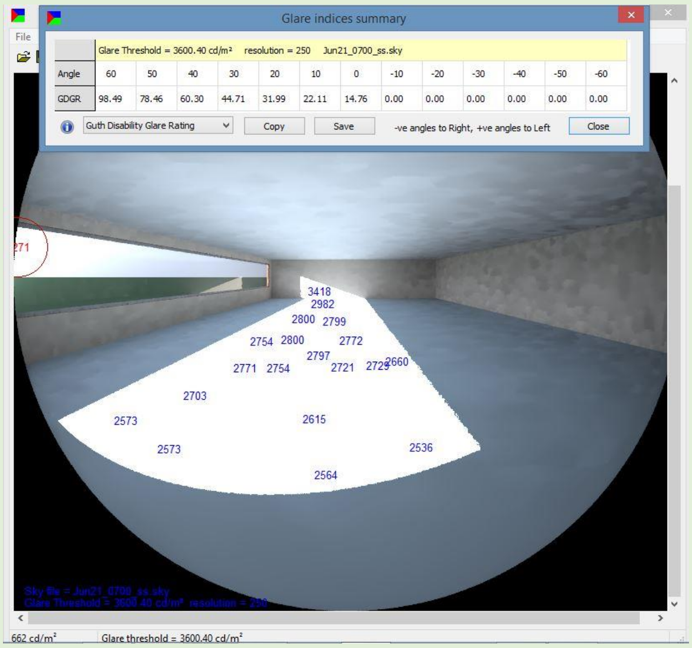
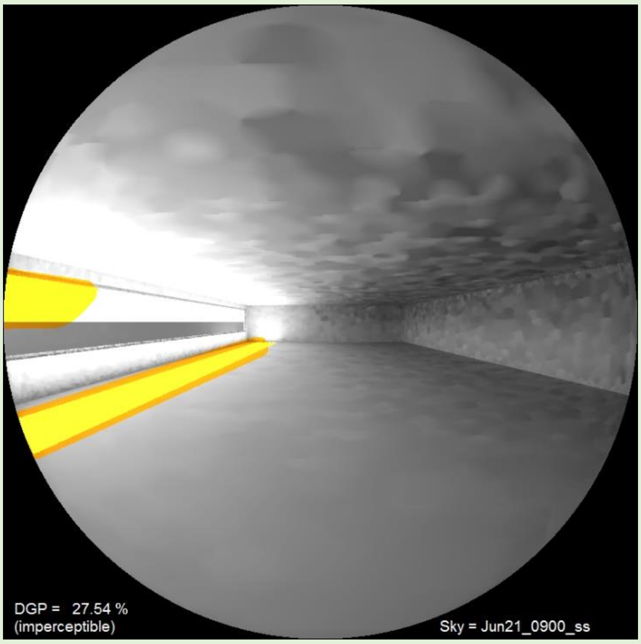

Glare indices summary
Glare Threshold = 3600.40 cd/m² resolution = 250 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 98.49 78.46 60.30 44.71 31.99 22.11 14.76 0.00 0.00 0.00 0.00 0.00 0.00
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3418
2982
2800 2799
2754 2800 2772
2797
2771 2754 2721 2729 2660
2703
2573 2615
2573 2536
2564
662 cd/m²
Glare threshold = 3600.40 cd/m²

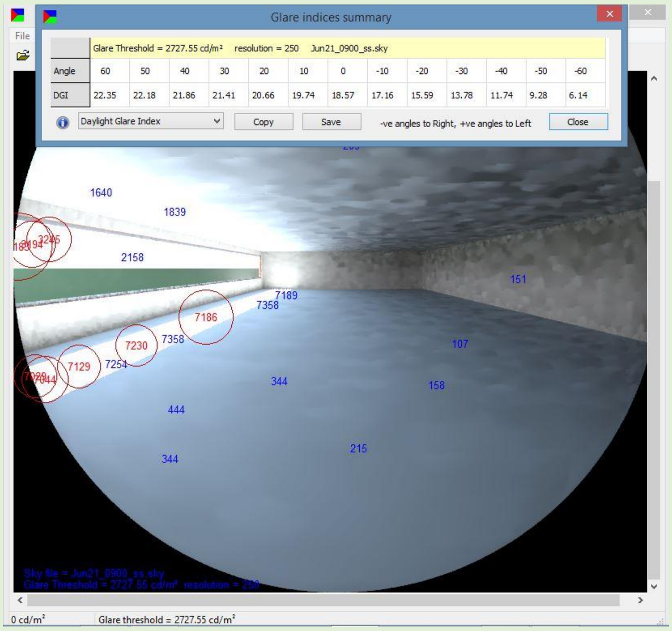
Table 124: Daylight and Glare Analysis for Jun 21, with sunny sky, (E), (P5),(T9).

Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P5) (T9).

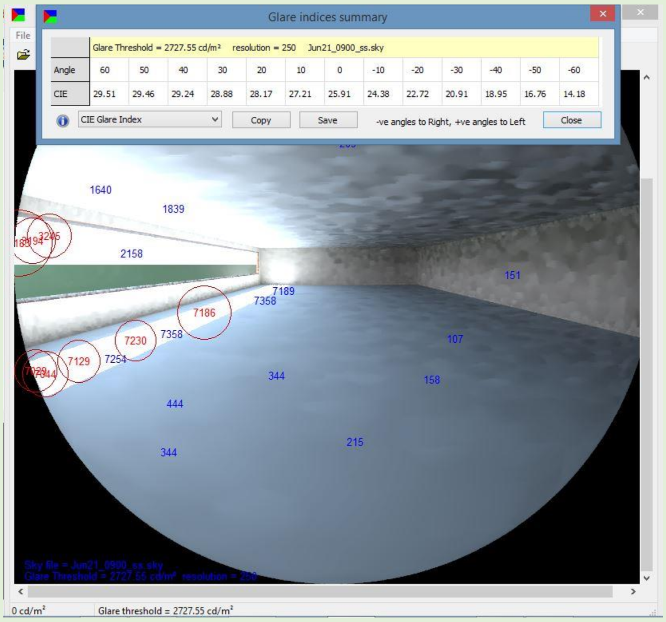
DGP



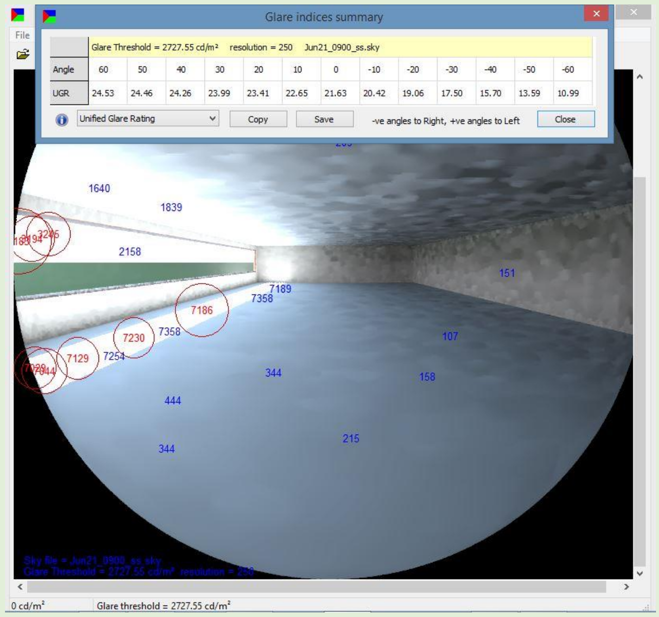
DGI



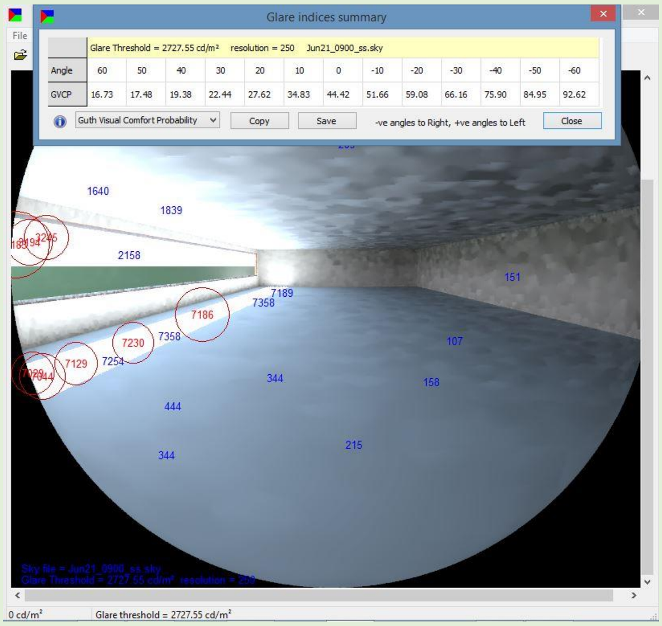
CGI



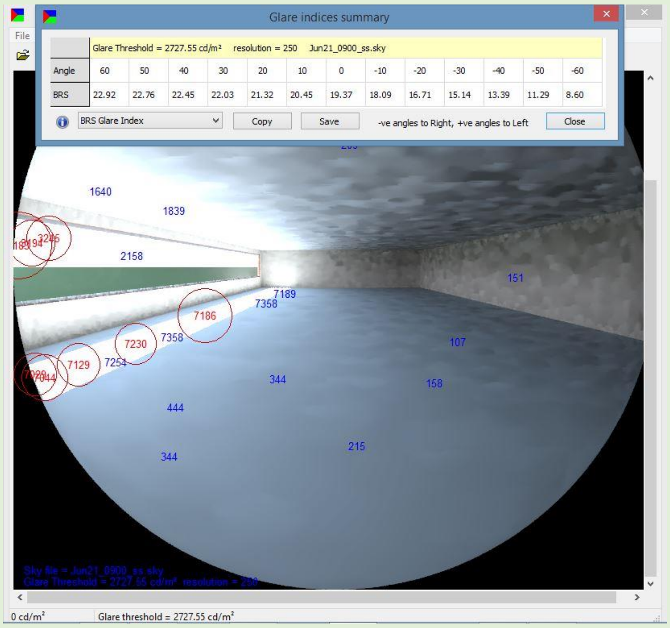
UGR



VCP


Glare indices summary
Glare Threshold = 2727.55 cd/m² resolution = 250 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 16.73 17.48 19.38 22.44 27.62 34.83 44.42 51.66 59.08 66.16 75.90 84.95 92.62
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
0 cd/m²
Glare threshold = 2727.55 cd/m²

BRS


Glare indices summary
Glare Threshold = 2727.55 cd/m² resolution = 250 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 22.92 22.76 22.45 22.03 21.32 20.45 19.37 18.09 16.71 15.14 13.39 11.29 8.60
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
0 cd/m²
Glare threshold = 2727.55 cd/m²

GDGR

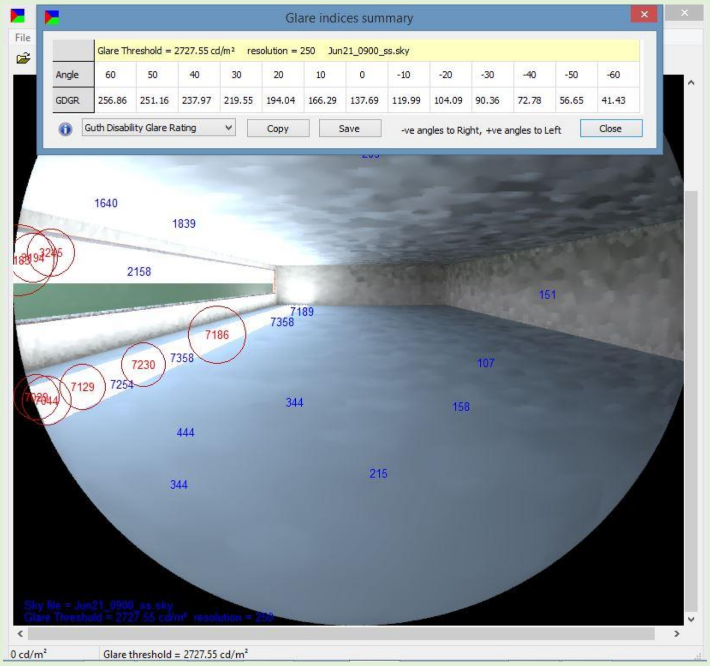
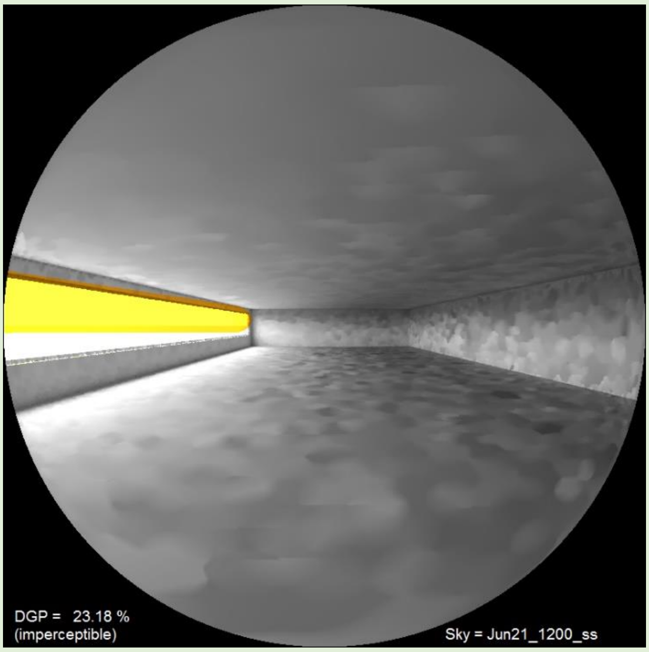

Glare indices summary
Glare Threshold = 2727.55 cd/m² resolution = 250 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 256.86 251.16 237.97 219.55 194.04 166.29 137.69 119.99 104.09 90.36 72.78 56.65 41.43
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
0 cd/m²
Glare threshold = 2727.55 cd/m²

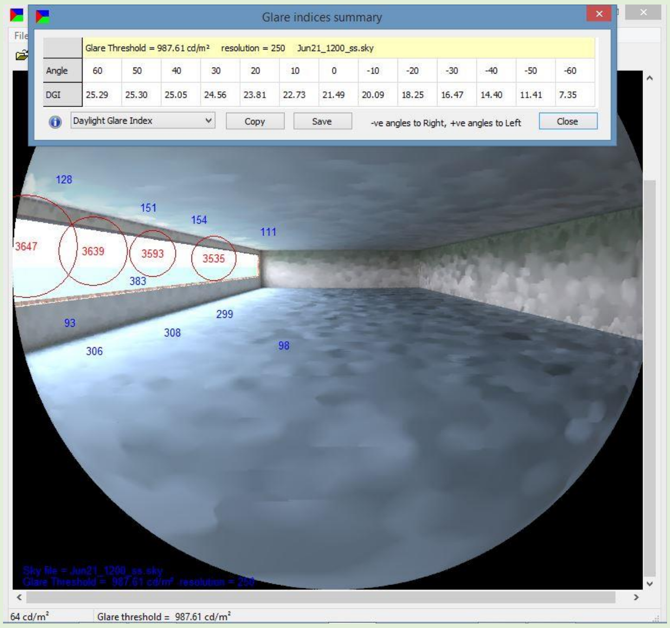
Table 125: Daylight and Glare Analysis for Jun 21, with sunny sky, (E), (P5),(T12).

Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P5) (T12).

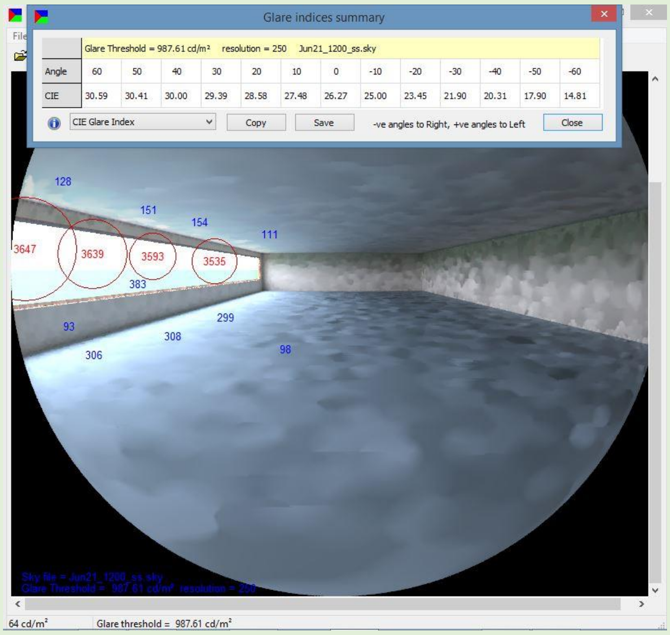
DGP



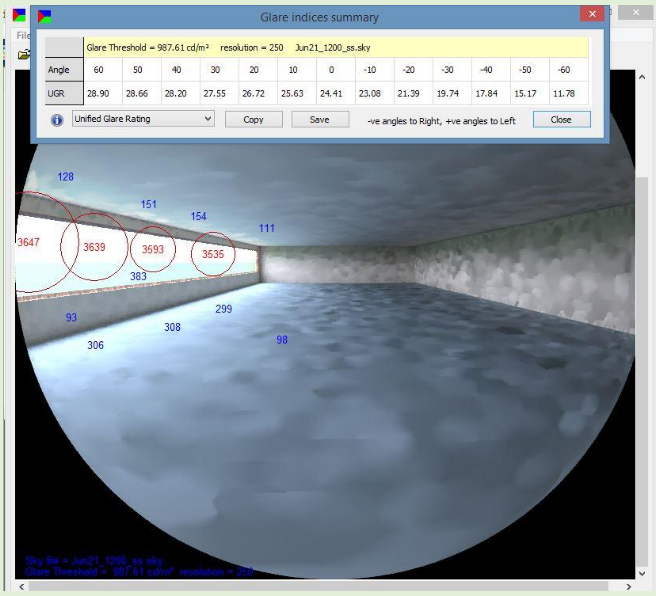
DGI



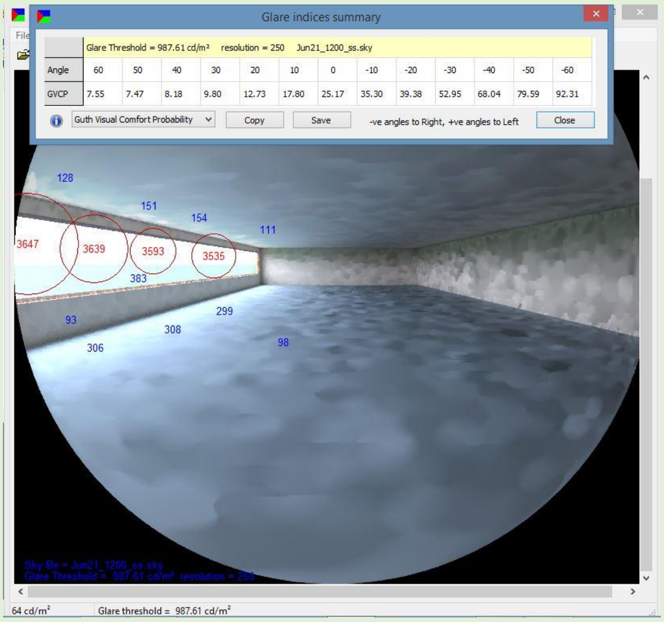
CGI



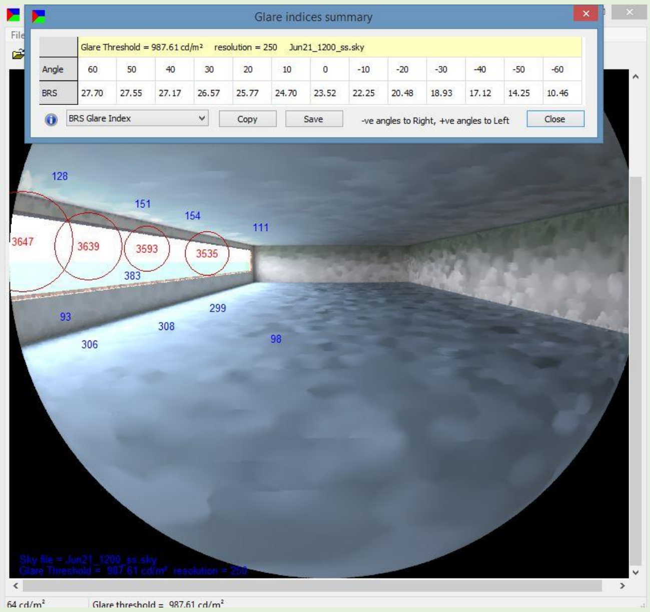
UGR



VCP


Glare indices summary
Glare Threshold = 987.61 cd/m² resolution = 250 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 7.55 7.47 8.18 9.80 12.73 17.80 25.17 35.30 39.38 52.95 68.04 79.59 92.31
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
128
151
154
111
3647
3639
3593
3535
383
93
299
308
306
98
64 cd/m²
Glare threshold = 987.61 cd/m²

BRS


Glare indices summary
Glare Threshold = 987.61 cd/m² resolution = 250 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 27.70 27.55 27.17 26.57 25.77 24.70 23.52 22.25 20.48 18.93 17.12 14.25 10.46
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
128
151
154
111
3647
3639
3593
3535
383
93
299
308
306
98
64 cd/m²
Glare threshold = 987.61 cd/m²

GDGR

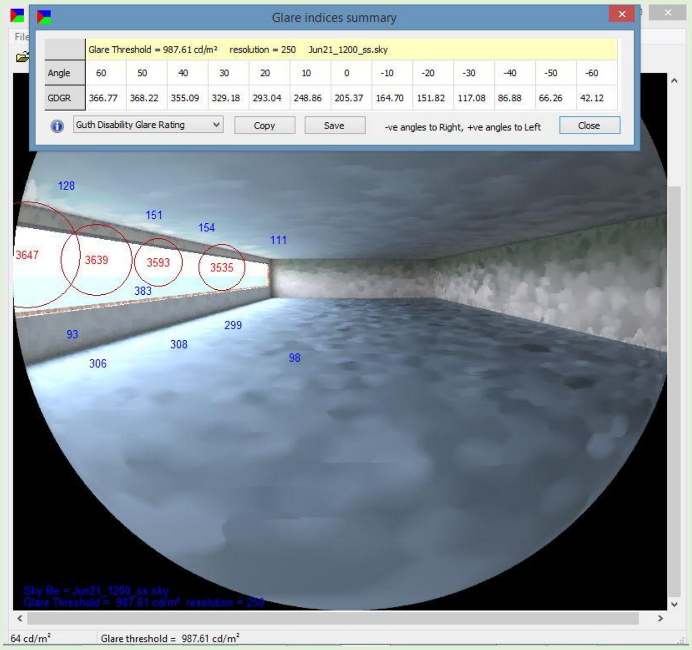
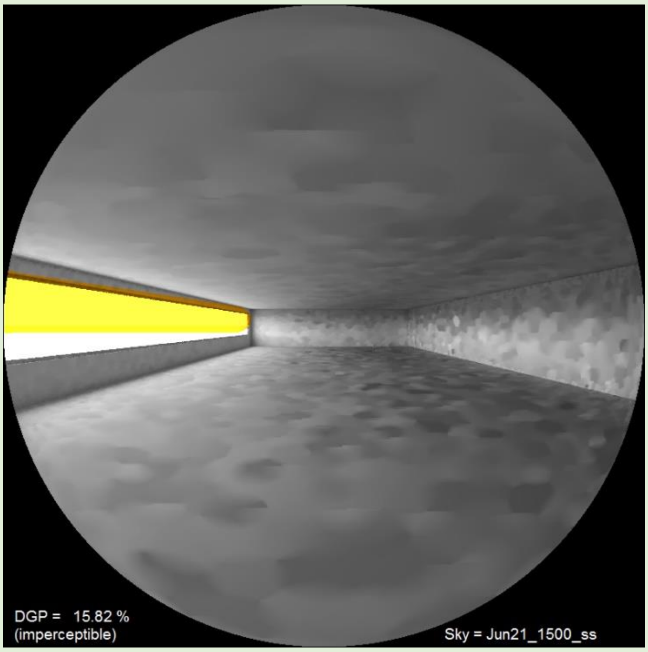

Glare indices summary
Glare Threshold = 987.61 cd/m² resolution = 250 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 366.77 368.22 355.09 329.18 293.04 248.86 205.37 164.70 151.82 117.08 86.88 66.26 42.12
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
128
151
154
111
3647
3639
3593
3535
383
93
299
308
306
98
64 cd/m²
Glare threshold = 987.61 cd/m²

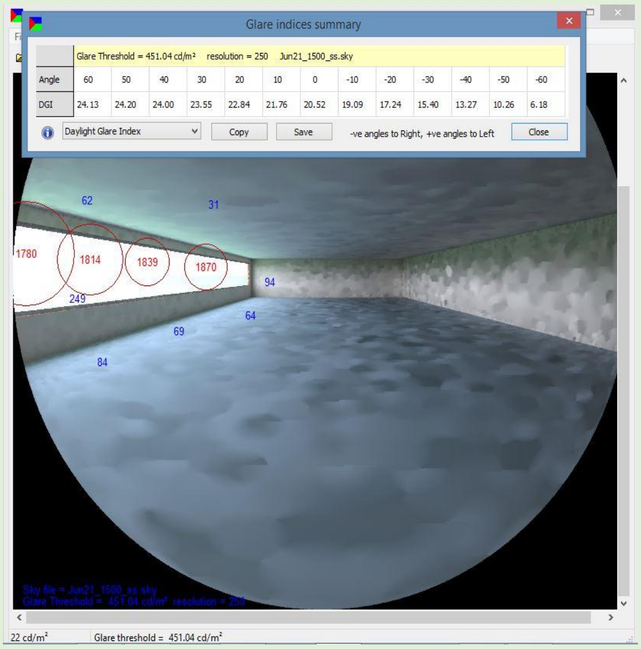
Table 126: Daylight and Glare Analysis for Jun 21, with sunny sky, (E), (P5),(T15).

Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P5) (T15).

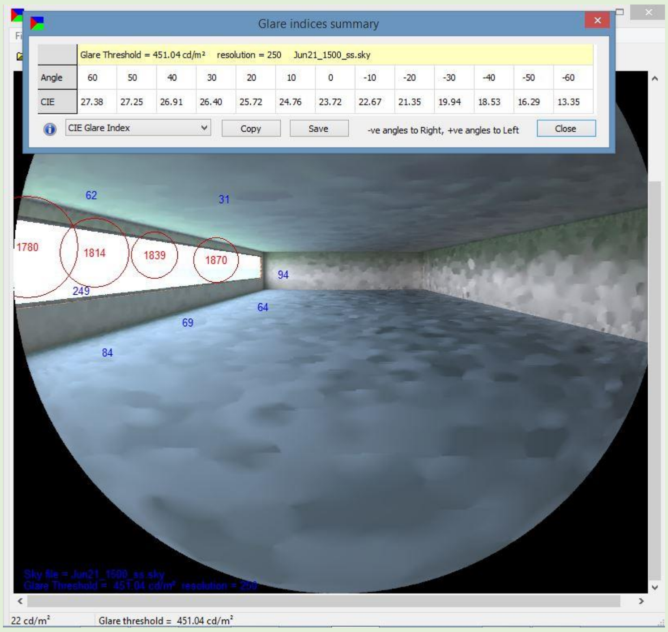
DGP



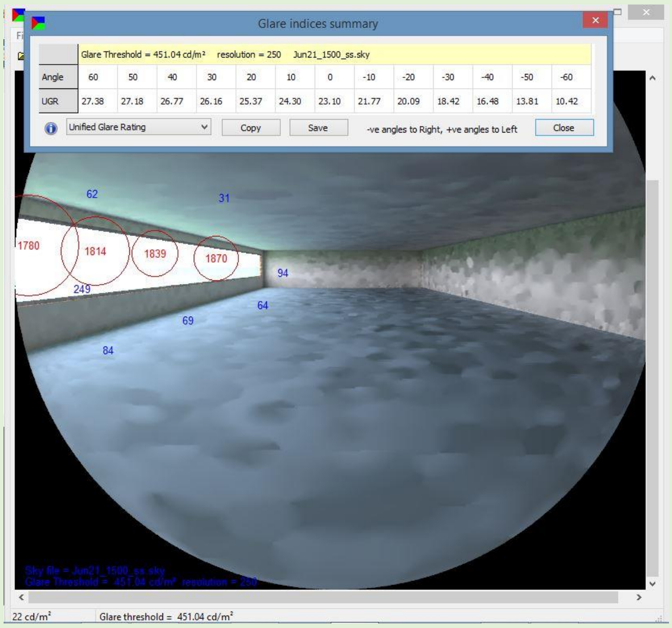
DGI

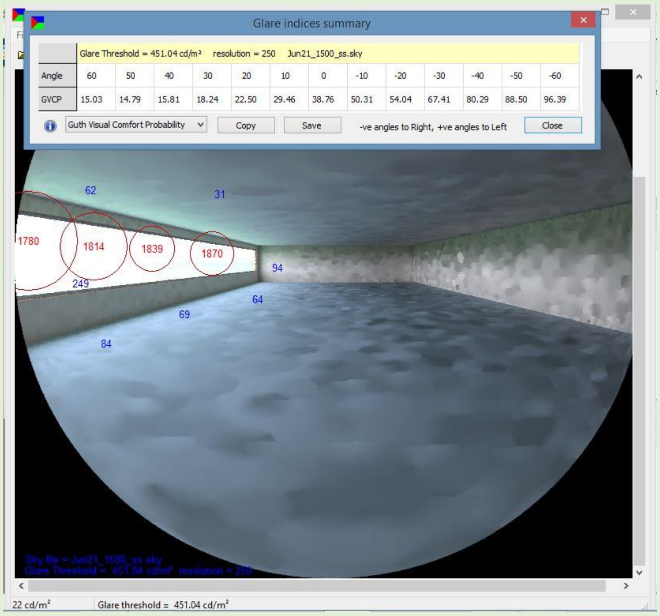
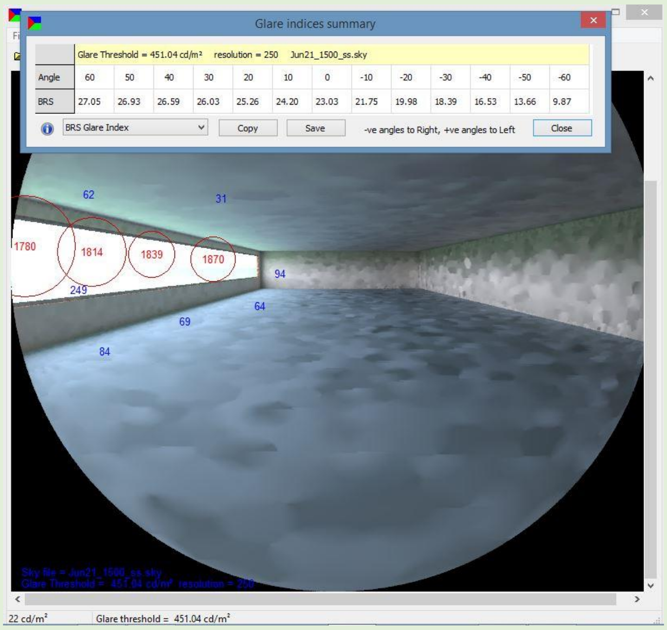


CGI



UGR

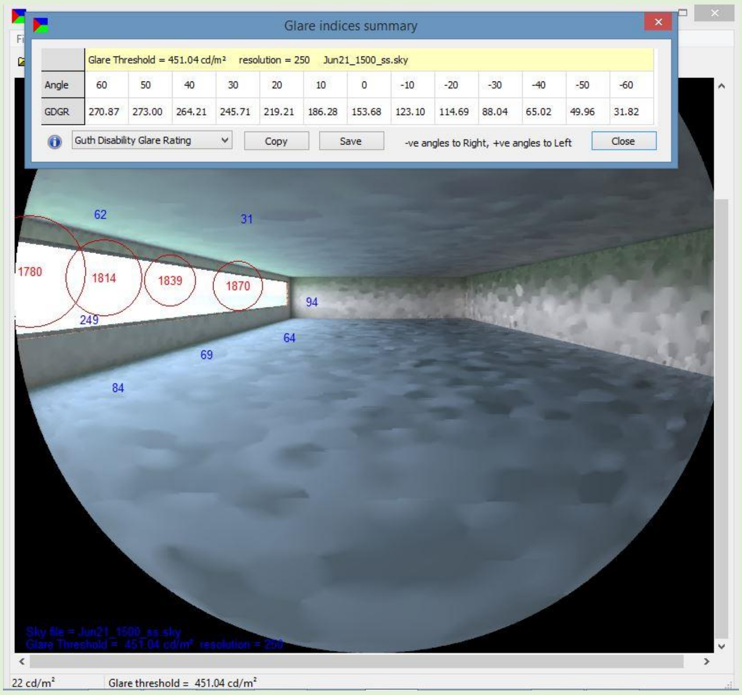


VCP	BRS
	

Glare indices summary
Glare Threshold = 451.04 cd/m² resolution = 250 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 15.03 14.79 15.81 18.24 22.50 29.46 38.76 50.31 54.04 67.41 80.29 88.50 96.39
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
62
31
1780
1814
1839
1870
94
249
64
69
84
22 cd/m²
Glare threshold = 451.04 cd/m²

Glare indices summary
Glare Threshold = 451.04 cd/m² resolution = 250 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 27.05 26.93 26.59 26.03 25.26 24.20 23.03 21.75 19.98 18.39 16.53 13.66 9.87
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
62
31
1780
1814
1839
1870
94
249
64
69
84
22 cd/m²
Glare threshold = 451.04 cd/m²

GDGR

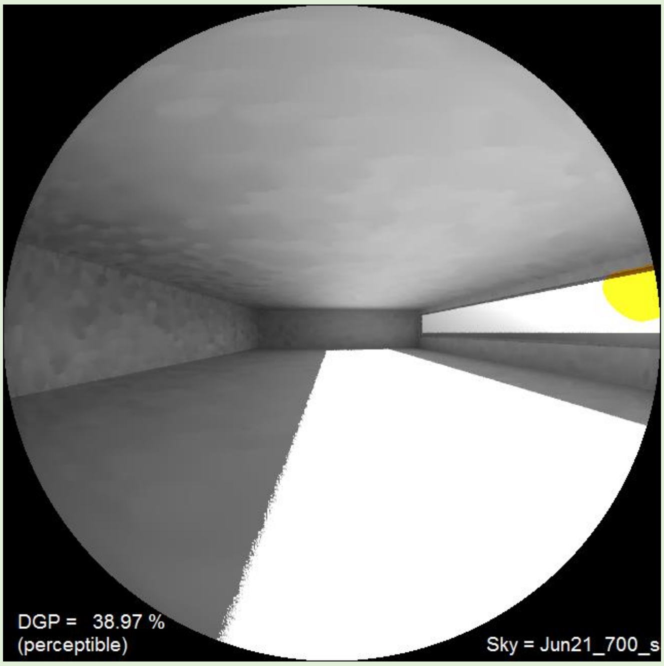


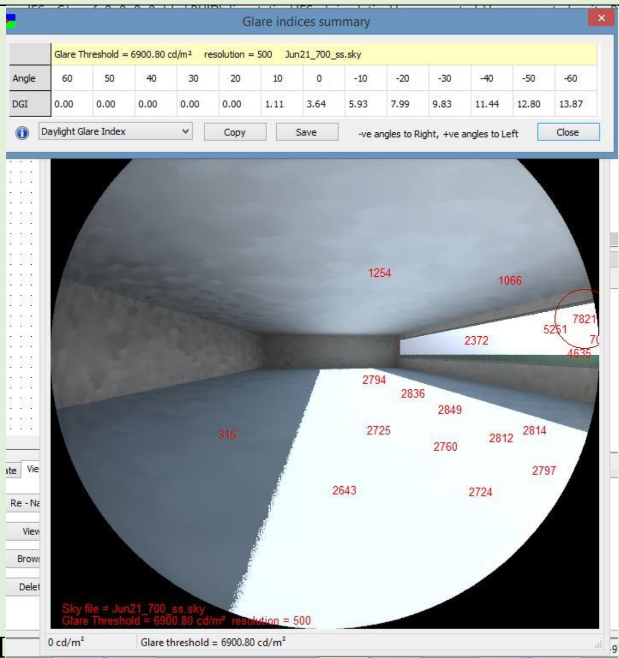
Glare indices summary
Glare Threshold = 451.04 cd/m² resolution = 250 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 270.87 273.00 264.21 245.71 219.21 186.28 153.68 123.10 114.69 88.04 65.02 49.96 31.82
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
62
31
1780
1814
1839
1870
94
249
64
69
84
22 cd/m²
Glare threshold = 451.04 cd/m²

Table 127: Daylight and Glare Analysis for Jun 21, with sunny sky, (E), (P6),(T7).

Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P6) (T7).

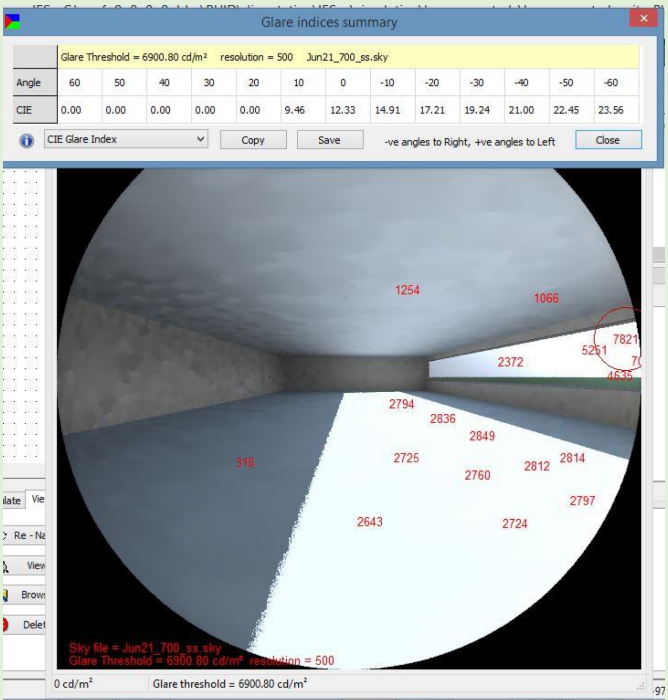
DGP



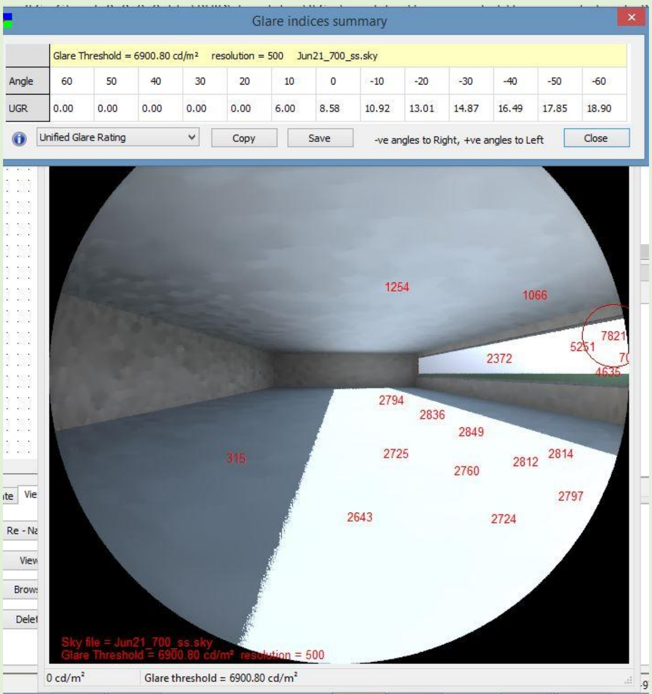


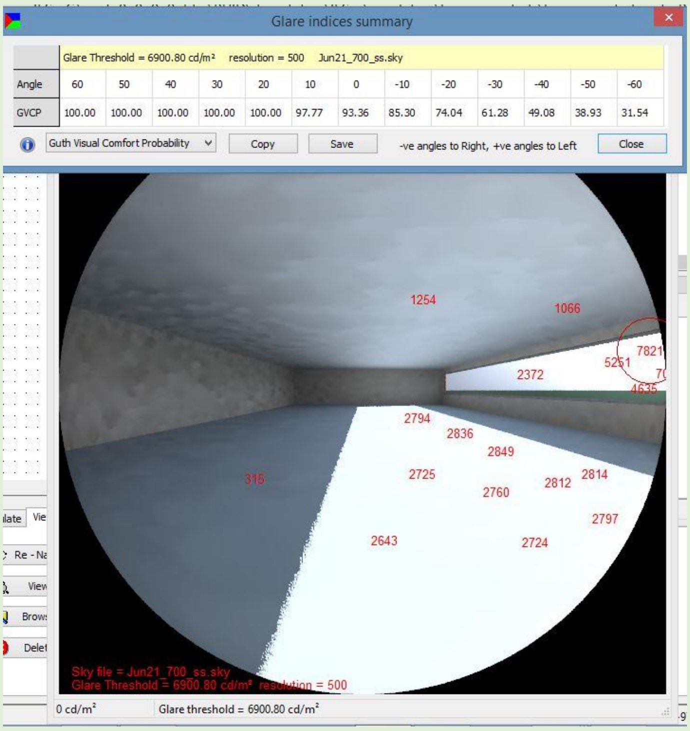
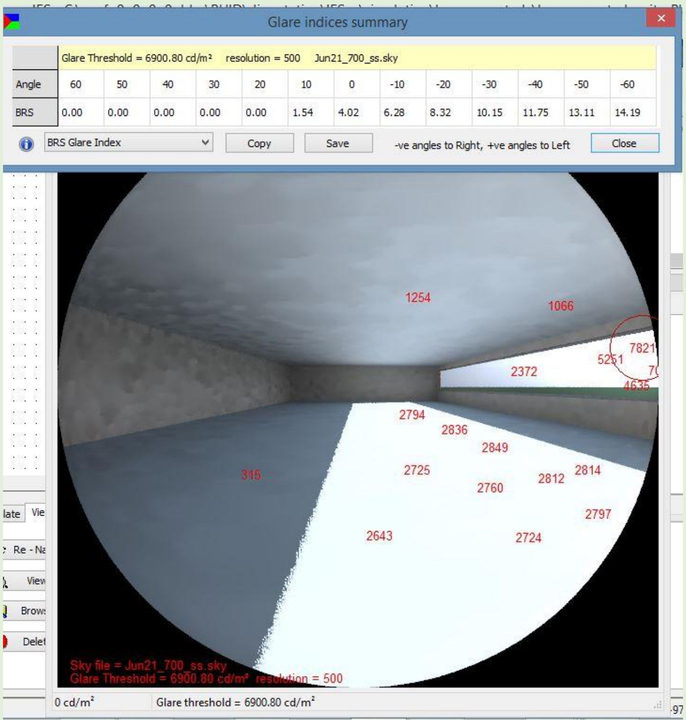
DGI

CGI



UGR

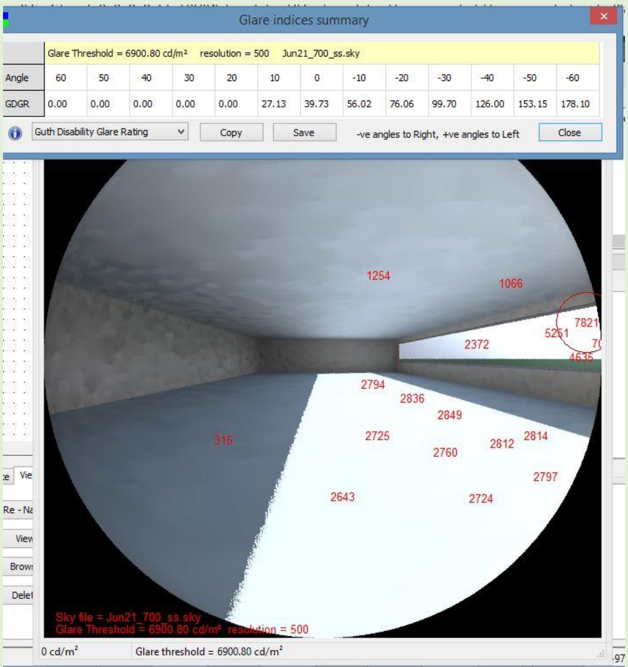


VCP	BRS
	

Glare indices summary
Glare Threshold = 6900.80 cd/m² resolution = 500 Jun21_700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 100.00 100.00 100.00 100.00 100.00 97.77 93.36 85.30 74.04 61.28 49.08 38.93 31.54
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_700_ss.sky
Glare Threshold = 6900.80 cd/m² resolution = 500
0 cd/m²
Glare threshold = 6900.80 cd/m²

Glare indices summary
Glare Threshold = 6900.80 cd/m² resolution = 500 Jun21_700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 0.00 0.00 0.00 0.00 0.00 1.54 4.02 6.28 8.32 10.15 11.75 13.11 14.19
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_700_ss.sky
Glare Threshold = 6900.80 cd/m² resolution = 500
0 cd/m²
Glare threshold = 6900.80 cd/m²

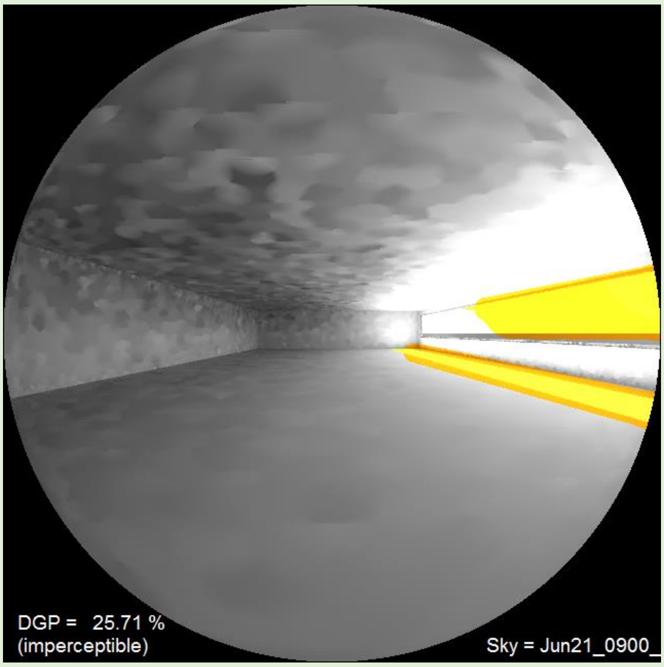
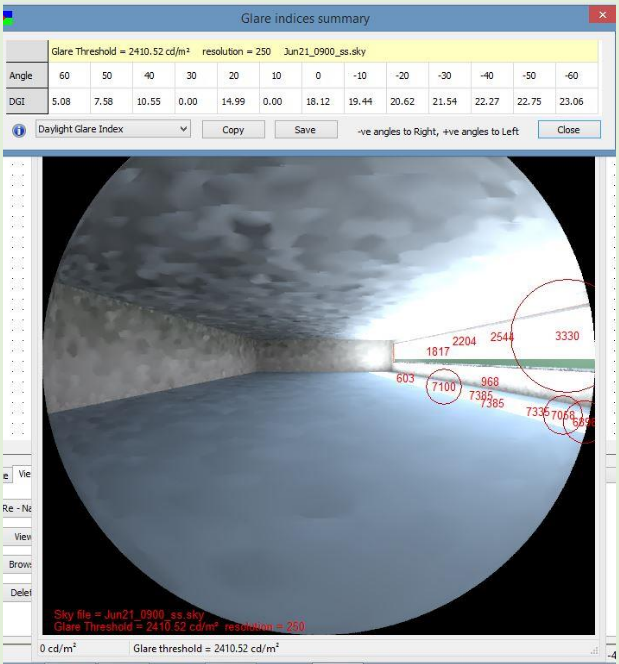
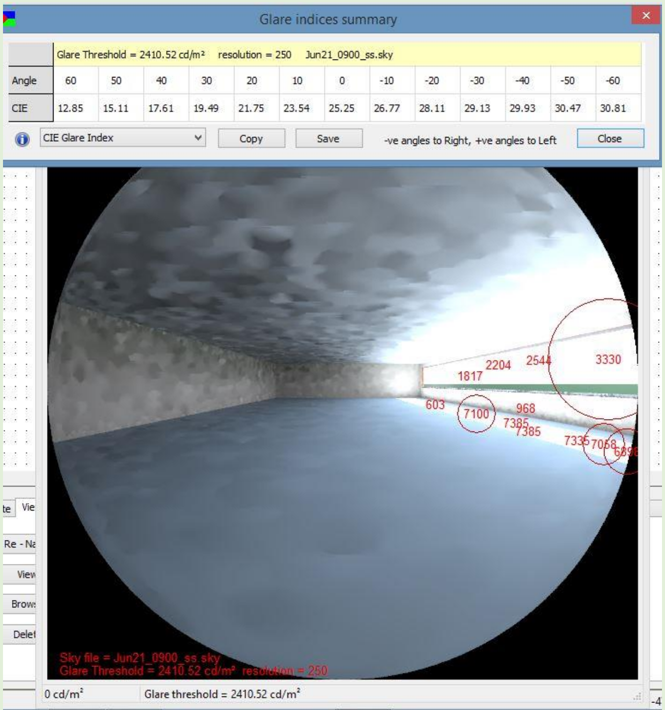
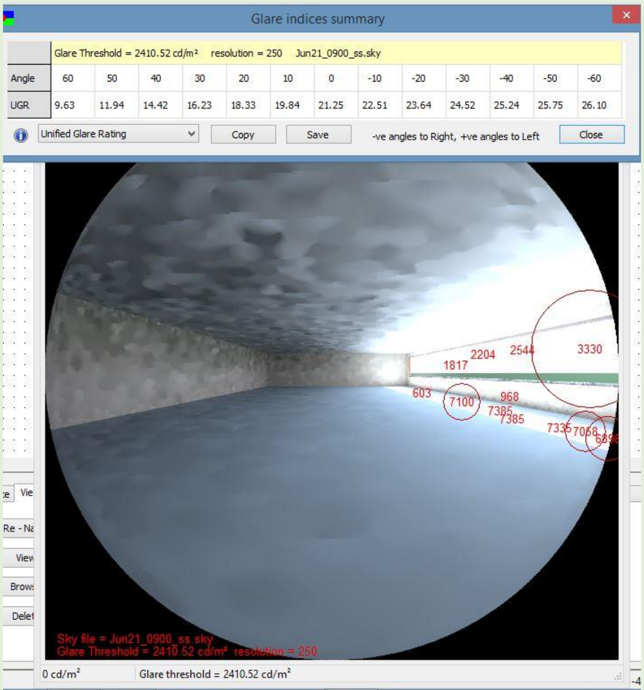
GDGR



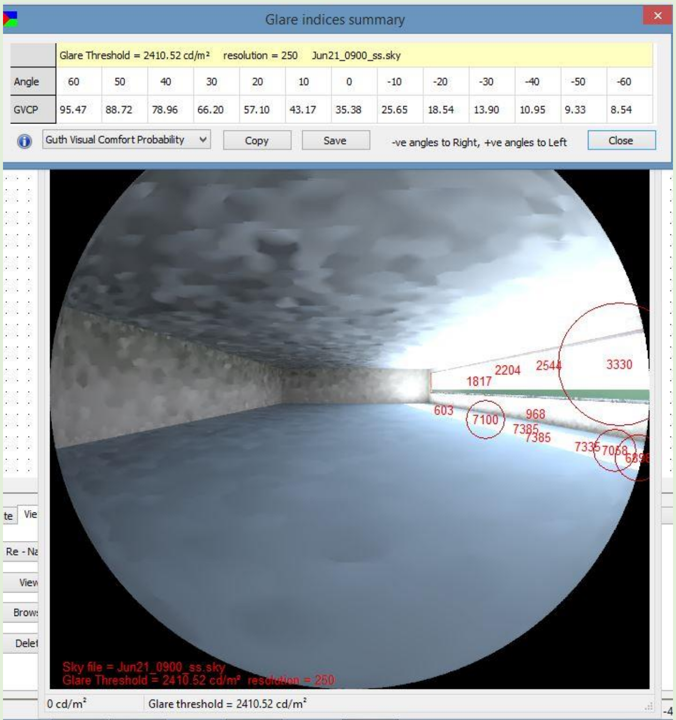
Glare indices summary
Glare Threshold = 6900.80 cd/m² resolution = 500 Jun21_700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 0.00 0.00 0.00 0.00 0.00 27.13 39.73 56.02 76.06 99.70 126.00 153.15 178.10
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_700_ss.sky
Glare Threshold = 6900.80 cd/m² resolution = 500
0 cd/m²
Glare threshold = 6900.80 cd/m²

Table 128: Daylight and Glare Analysis for Jun 21, with sunny sky, (E), (P6),(T9).

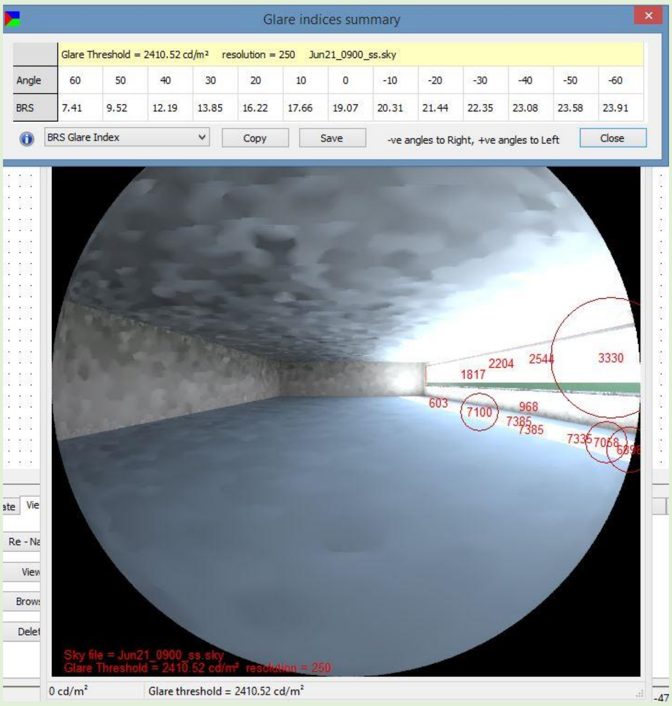
Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P6) (T9).

DGP	DGI
	
CGI	**UGR**
	

VCP


Glare indices summary
Glare Threshold = 2410.52 cd/m² resolution = 250 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 95.47 88.72 78.96 66.20 57.10 43.17 35.38 25.65 18.54 13.90 10.95 9.33 8.54
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_0900_ss.sky
Glare Threshold = 2410.52 cd/m² resolution = 250
0 cd/m²
Glare threshold = 2410.52 cd/m²

BRS


Glare indices summary
Glare Threshold = 2410.52 cd/m² resolution = 250 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 7.41 9.52 12.19 13.85 16.22 17.66 19.07 20.31 21.44 22.35 23.08 23.58 23.91
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_0900_ss.sky
Glare Threshold = 2410.52 cd/m² resolution = 250
0 cd/m²
Glare threshold = 2410.52 cd/m²

GDGR

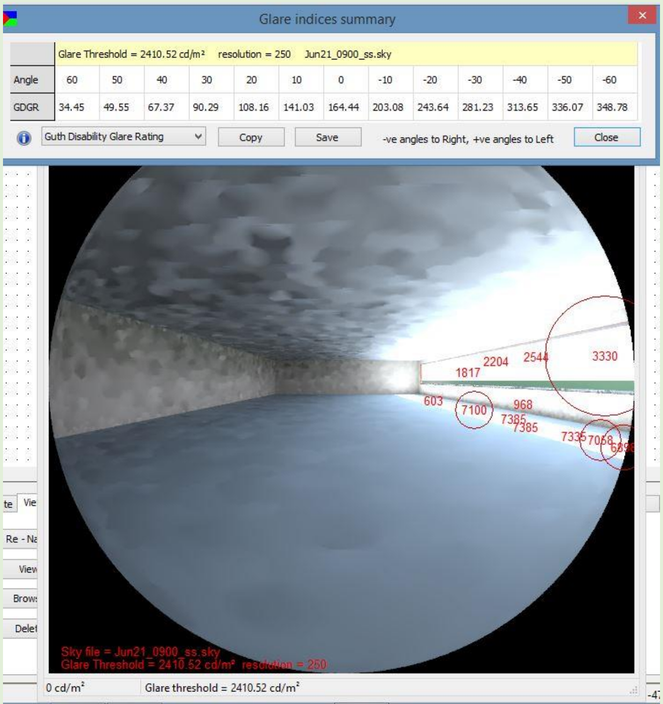
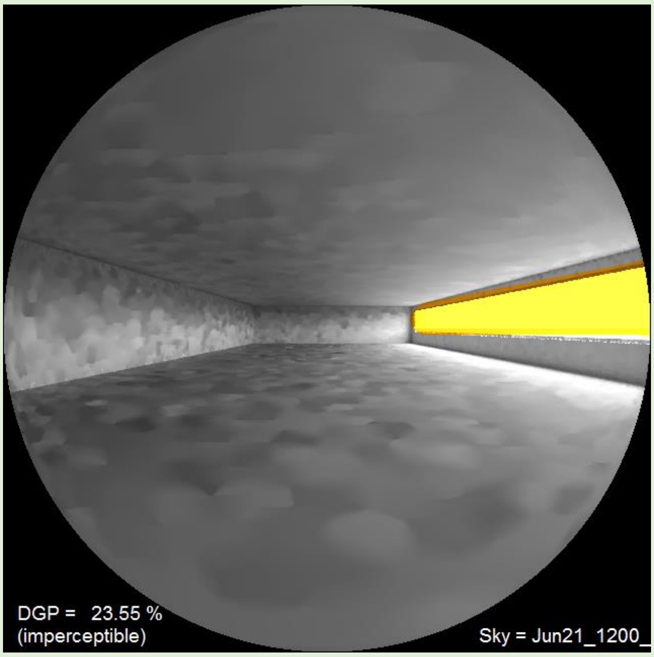

Glare indices summary
Glare Threshold = 2410.52 cd/m² resolution = 250 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 34.45 49.55 67.37 90.29 108.16 141.03 164.44 203.08 243.64 281.23 313.65 336.07 348.78
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_0900_ss.sky
Glare Threshold = 2410.52 cd/m² resolution = 250
0 cd/m²
Glare threshold = 2410.52 cd/m²

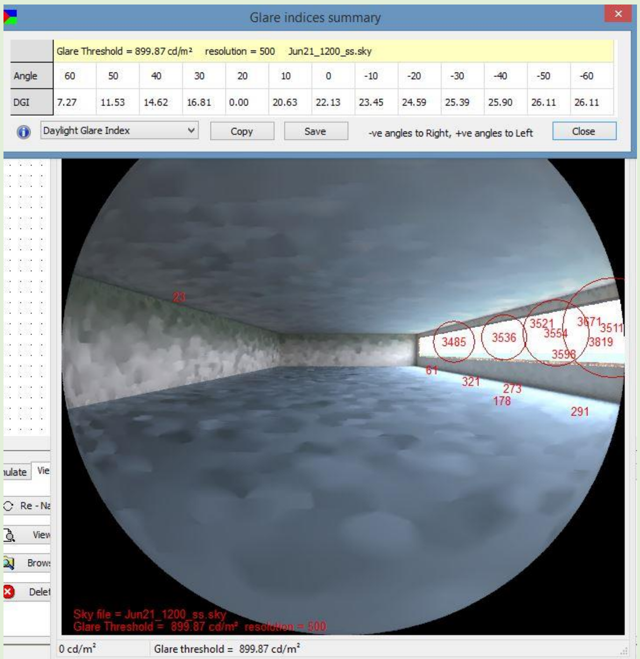
Table 129: Daylight and Glare Analysis for Jun 21, with sunny sky, (E), (P6),(T12).

Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P6) (T12).

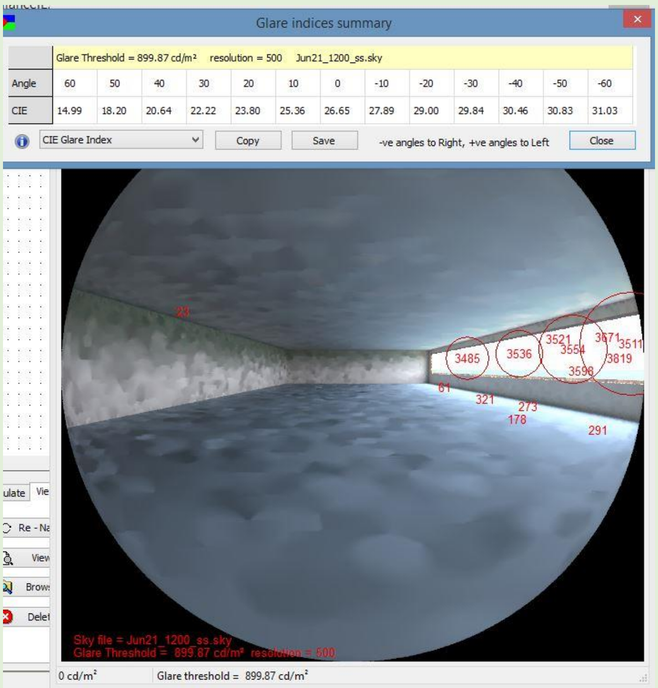
DGP



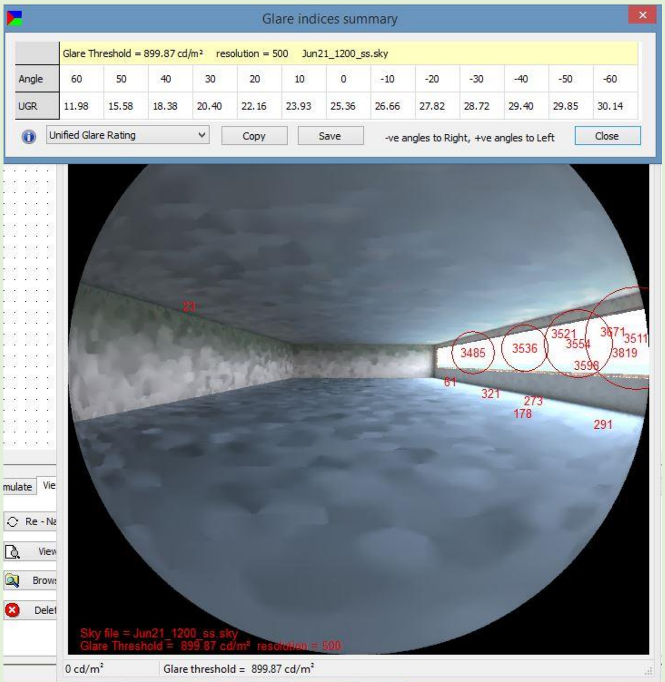
DGI

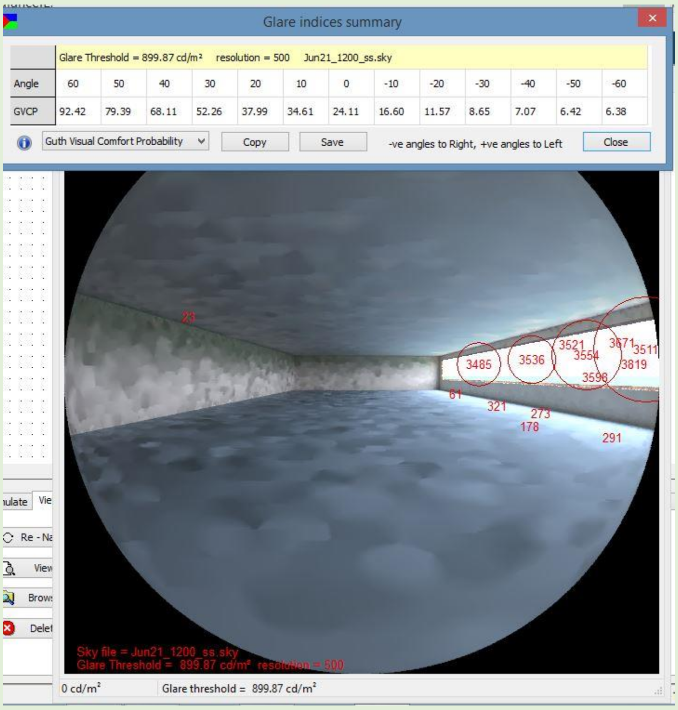
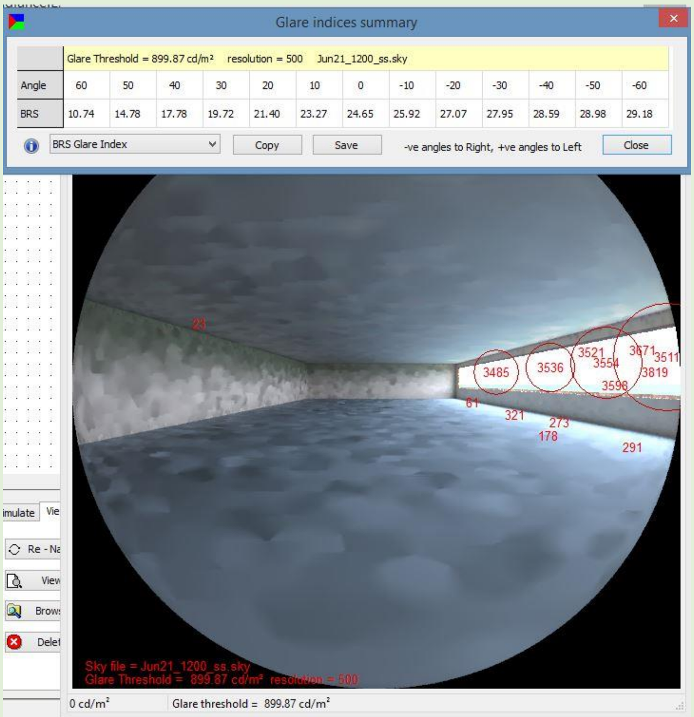


CGI



UGR

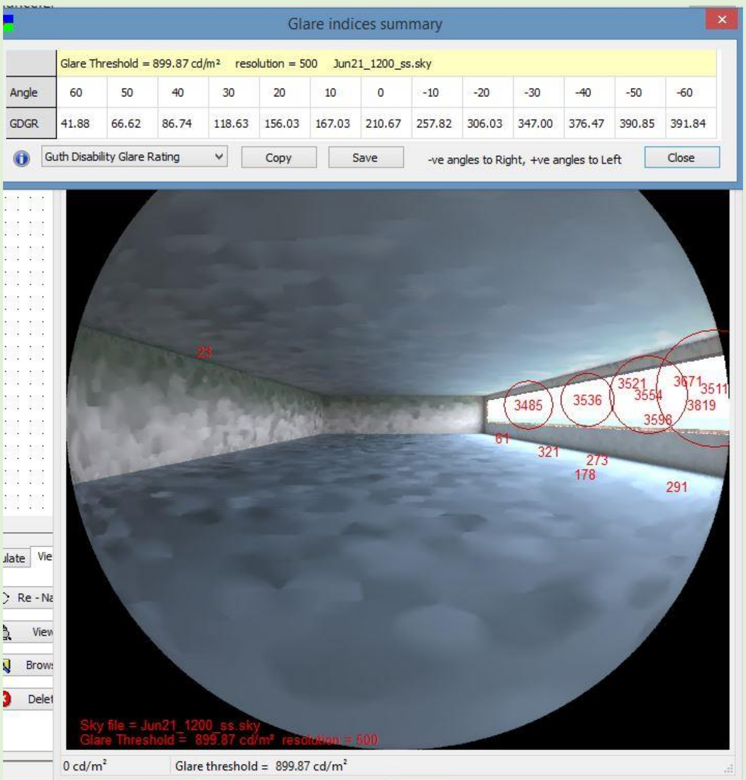


VCP	BRS
	

Glare indices summary
Glare Threshold = 899.87 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 92.42 79.39 68.11 52.26 37.99 34.61 24.11 16.60 11.57 8.65 7.07 6.42 6.38
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_1200_ss.sky
Glare Threshold = 899.87 cd/m² resolution = 500
0 cd/m²
Glare threshold = 899.87 cd/m²

Glare indices summary
Glare Threshold = 899.87 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 10.74 14.78 17.78 19.72 21.40 23.27 24.65 25.92 27.07 27.95 28.59 28.98 29.18
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_1200_ss.sky
Glare Threshold = 899.87 cd/m² resolution = 500
0 cd/m²
Glare threshold = 899.87 cd/m²

GDGR

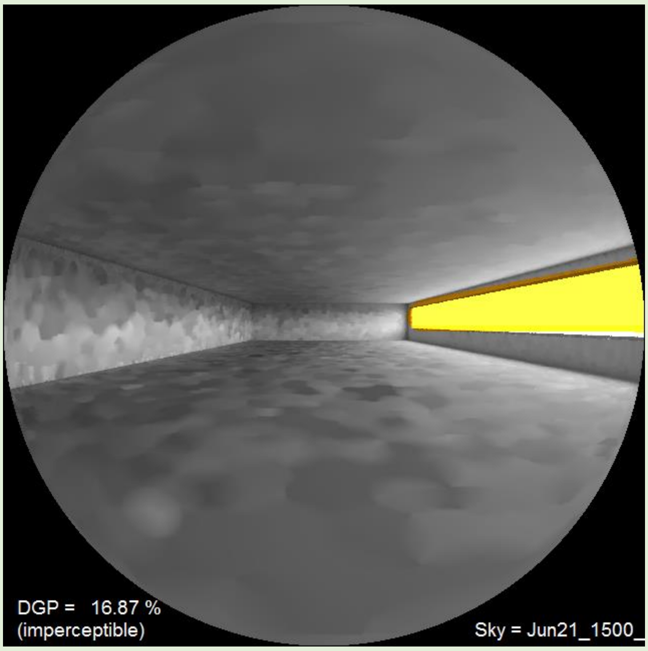


Glare indices summary
Glare Threshold = 899.87 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 41.88 66.62 86.74 118.63 156.03 167.03 210.67 257.82 306.03 347.00 376.47 390.85 391.84
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_1200_ss.sky
Glare Threshold = 899.87 cd/m² resolution = 500
0 cd/m²
Glare threshold = 899.87 cd/m²

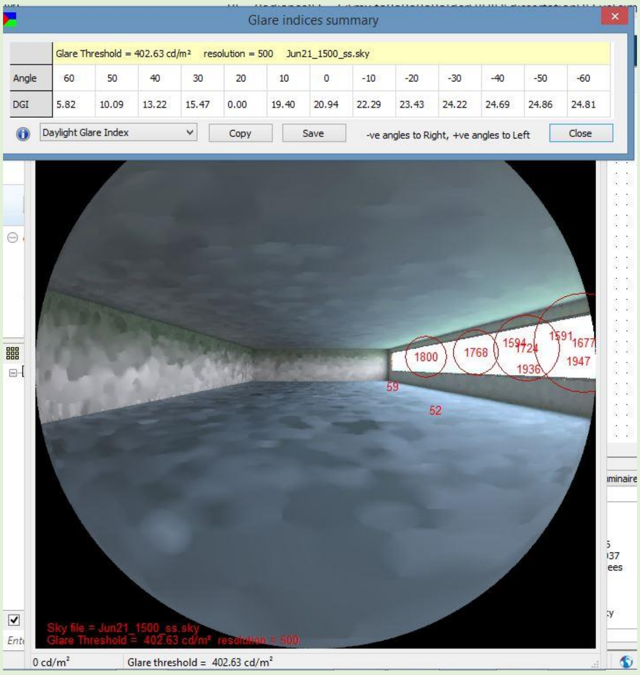
Table 130: Daylight and Glare Analysis for Jun 21, with sunny sky, (E), (P6),(T15).

Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P6) (T15).

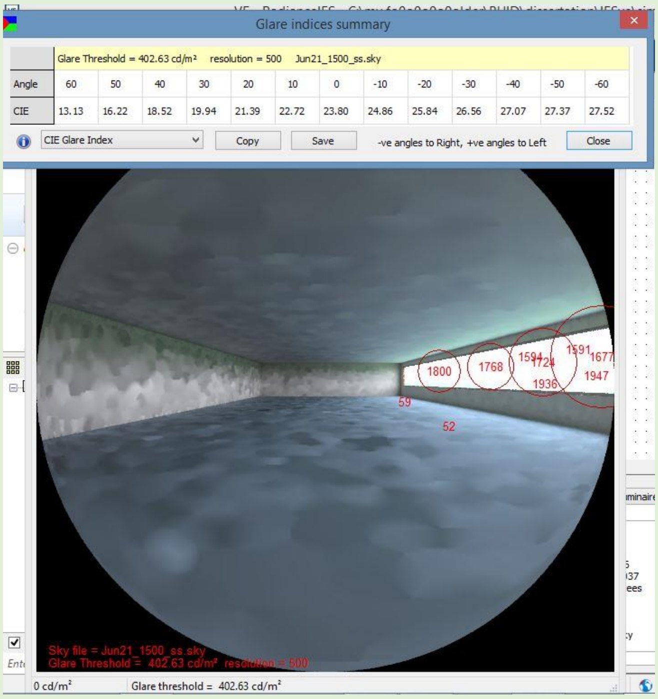
DGP



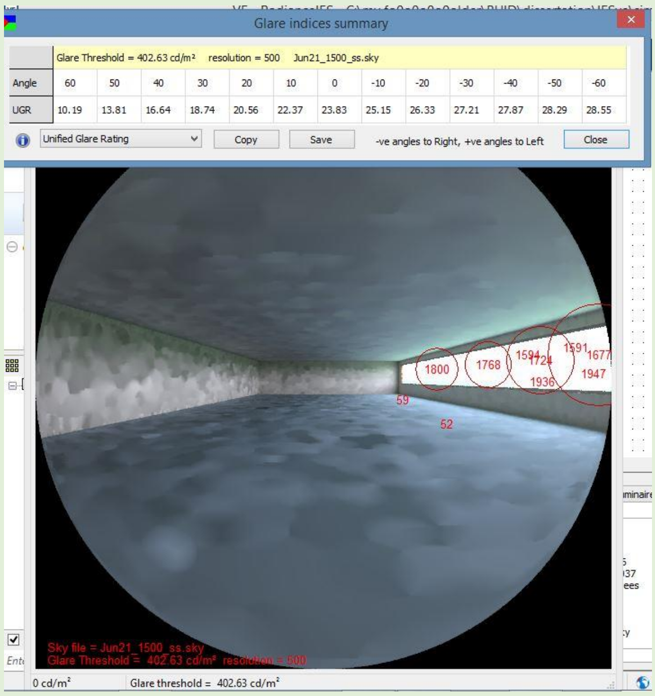
DGI



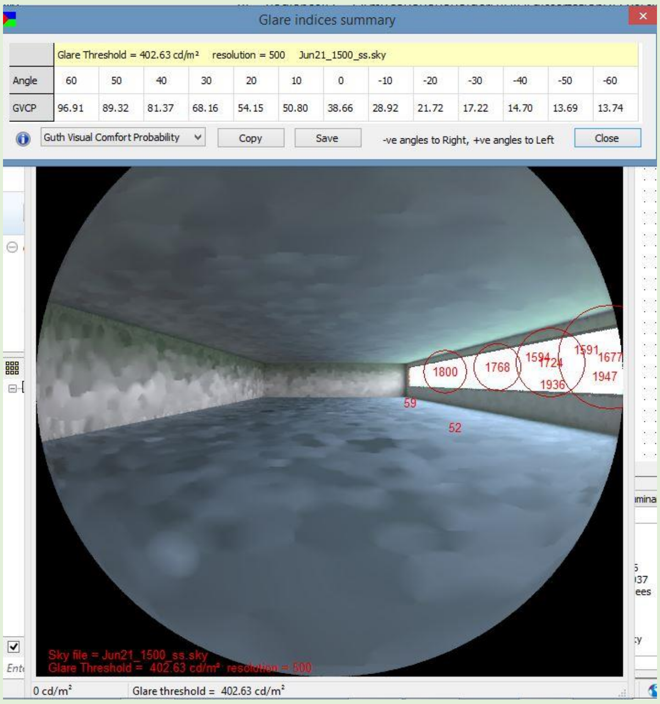
CGI



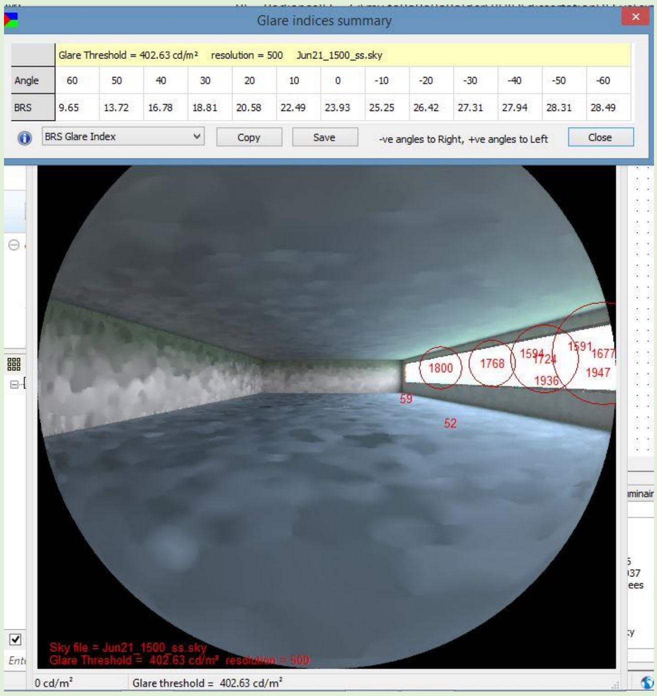
UGR



VCP


Glare indices summary
Glare Threshold = 402.63 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 96.91 89.32 81.37 68.16 54.15 50.80 38.66 28.92 21.72 17.22 14.70 13.69 13.74
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
0 cd/m²
Glare threshold = 402.63 cd/m²

BRS


Glare indices summary
Glare Threshold = 402.63 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 9.65 13.72 16.78 18.81 20.58 22.49 23.93 25.25 26.42 27.31 27.94 28.31 28.49
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
0 cd/m²
Glare threshold = 402.63 cd/m²

GDGR

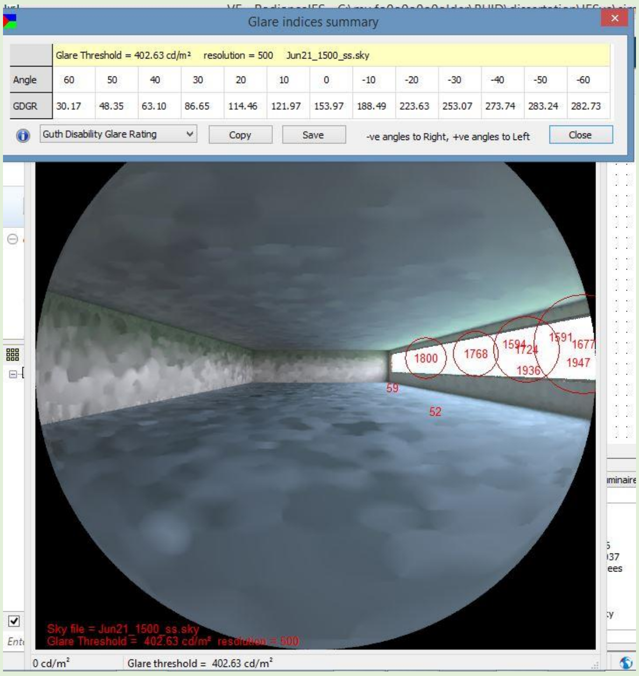
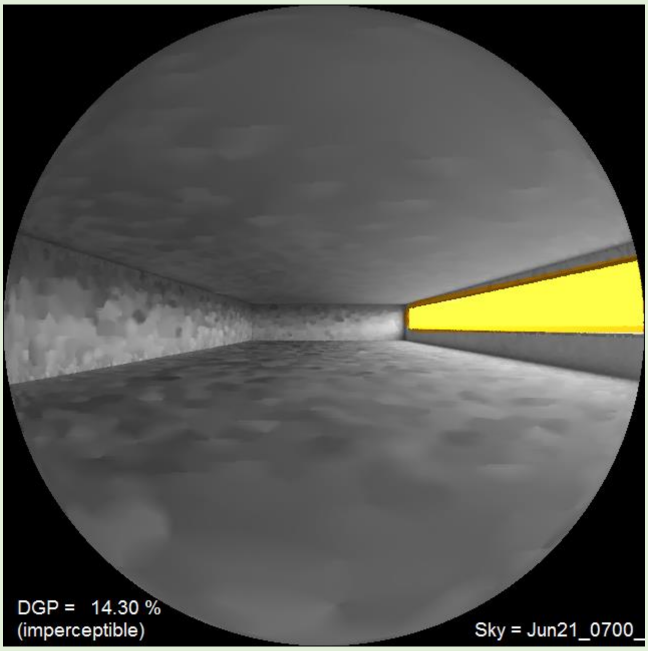

Glare indices summary
Glare Threshold = 402.63 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 30.17 48.35 63.10 86.65 114.46 121.97 153.97 188.49 223.63 253.07 273.74 283.24 282.73
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
0 cd/m²
Glare threshold = 402.63 cd/m²

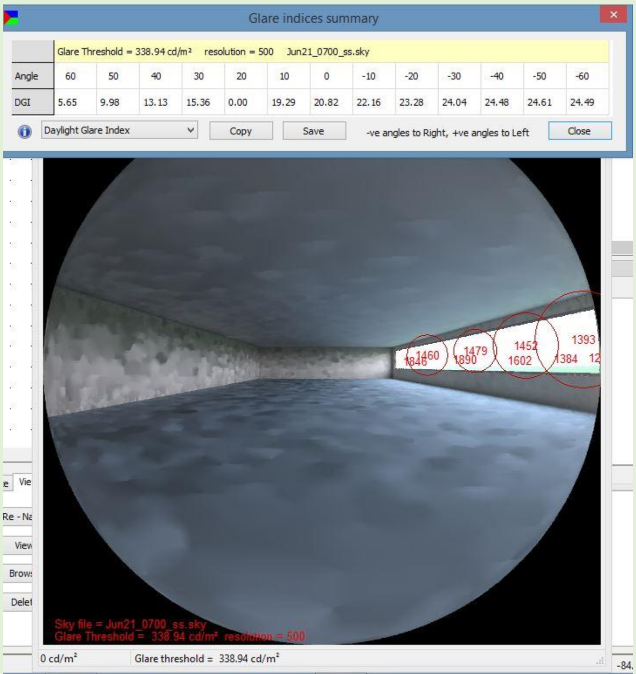
Table 131: Daylight and Glare Analysis for Jun 21, with sunny sky, (S), (P6),(T7).

Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P6) (T7).

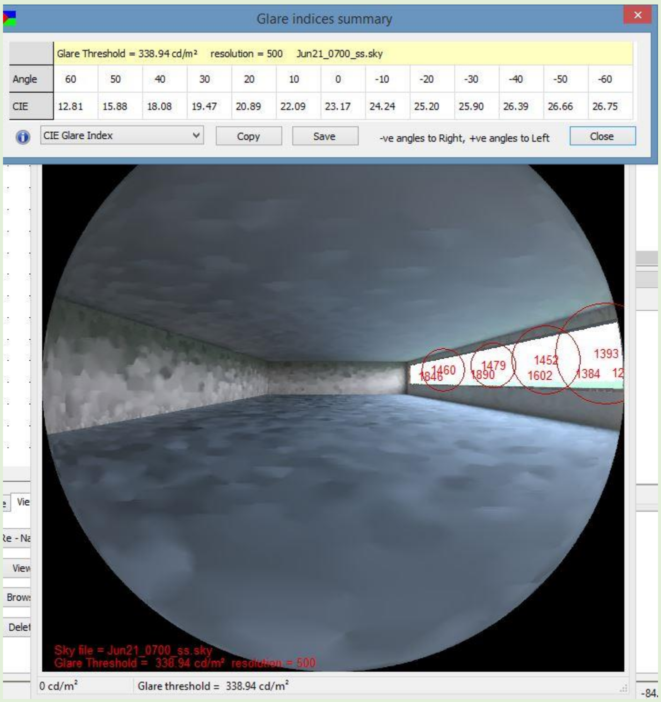
DGP



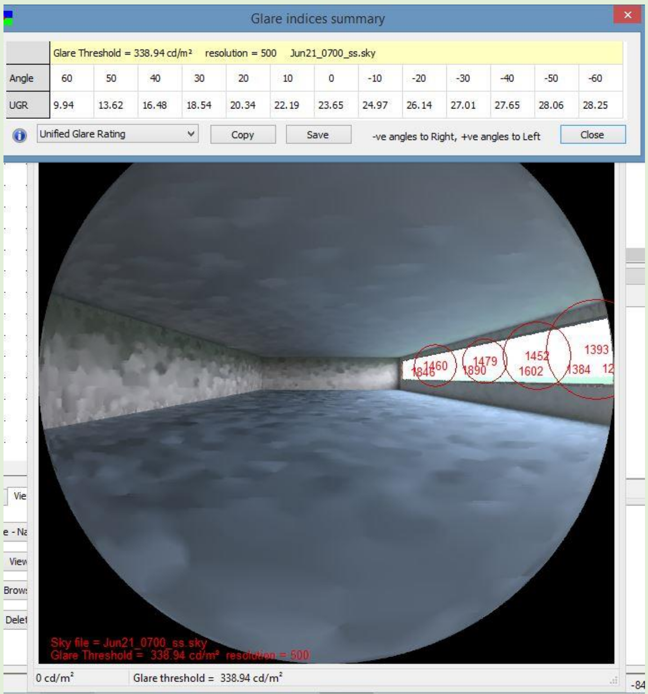
DGI



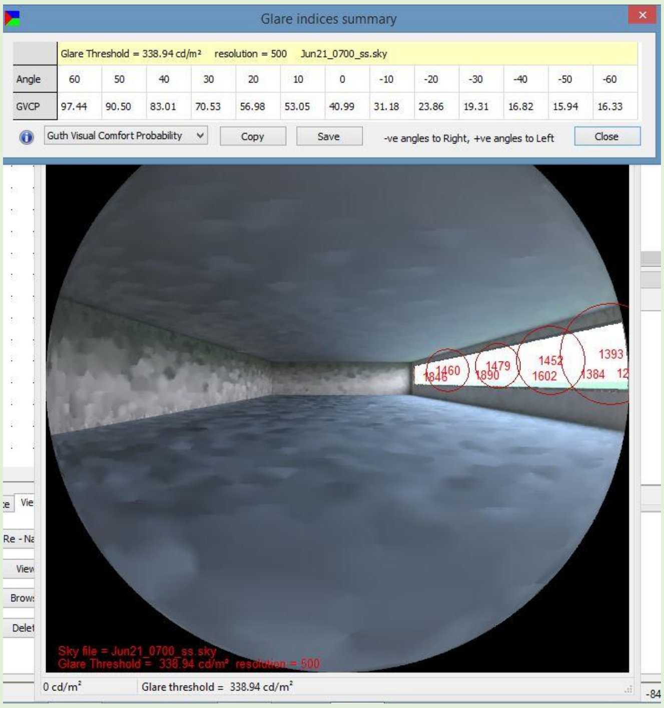
CGI



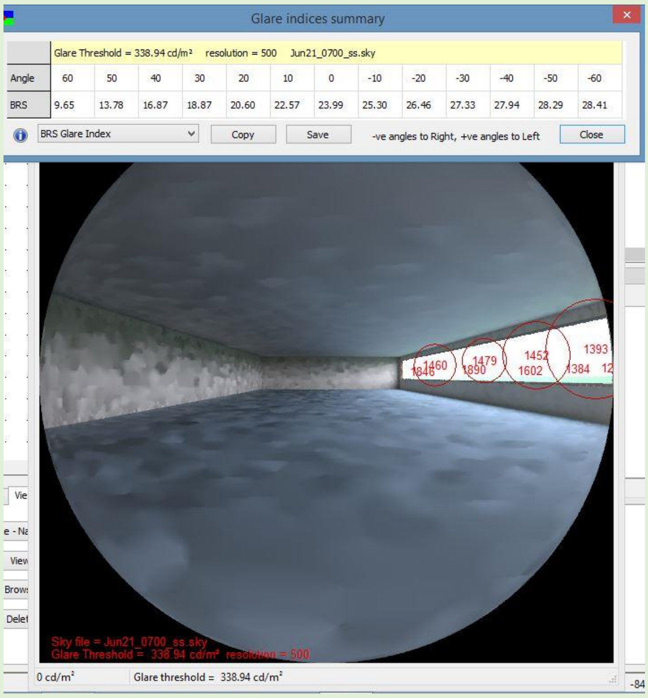
UGR



VCP


Glare indices summary
Glare Threshold = 338.94 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 97.44 90.50 83.01 70.53 56.98 53.05 40.99 31.18 23.86 19.31 16.82 15.94 16.33
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_0700_ss.sky
Glare Threshold = 338.94 cd/m² resolution = 500
0 cd/m²
Glare threshold = 338.94 cd/m²

BRS


Glare indices summary
Glare Threshold = 338.94 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 9.65 13.78 16.87 18.87 20.60 22.57 23.99 25.30 26.46 27.33 27.94 28.29 28.41
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_0700_ss.sky
Glare Threshold = 338.94 cd/m² resolution = 500
0 cd/m²
Glare threshold = 338.94 cd/m²

GDGR

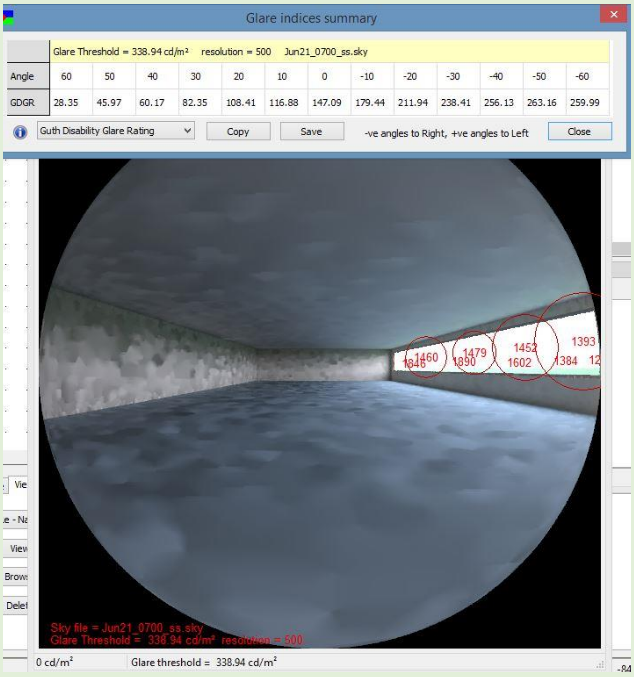
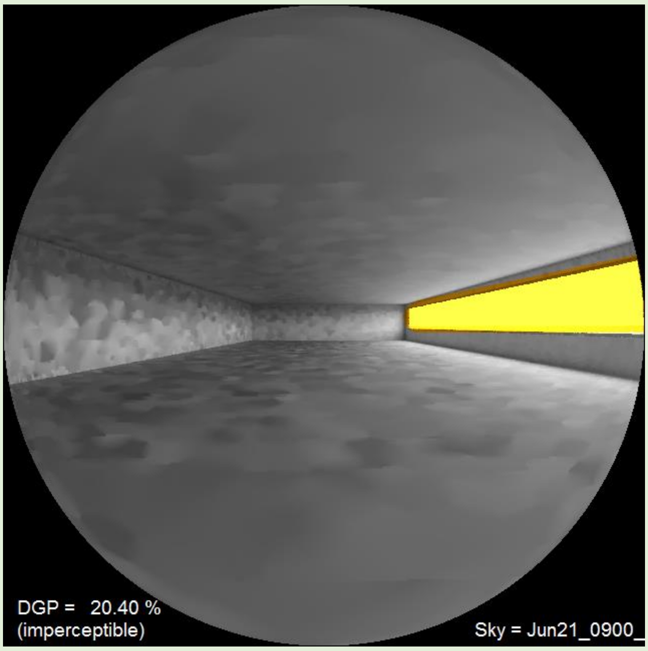

Glare indices summary
Glare Threshold = 338.94 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 28.35 45.97 60.17 82.35 108.41 116.88 147.09 179.44 211.94 238.41 256.13 263.16 259.99
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_0700_ss.sky
Glare Threshold = 338.94 cd/m² resolution = 500
0 cd/m²
Glare threshold = 338.94 cd/m²

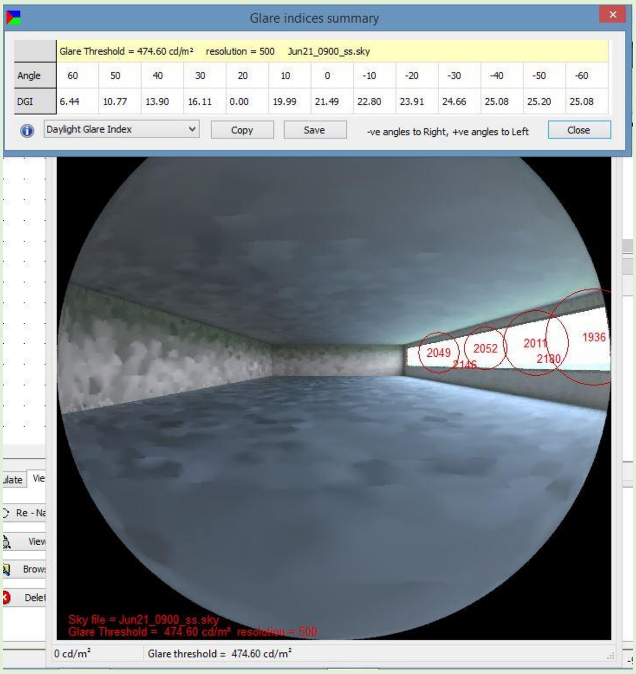
Table 132: Daylight and Glare Analysis for Jun 21, with sunny sky, (S), (P6),(T9).

Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P6) (T9).

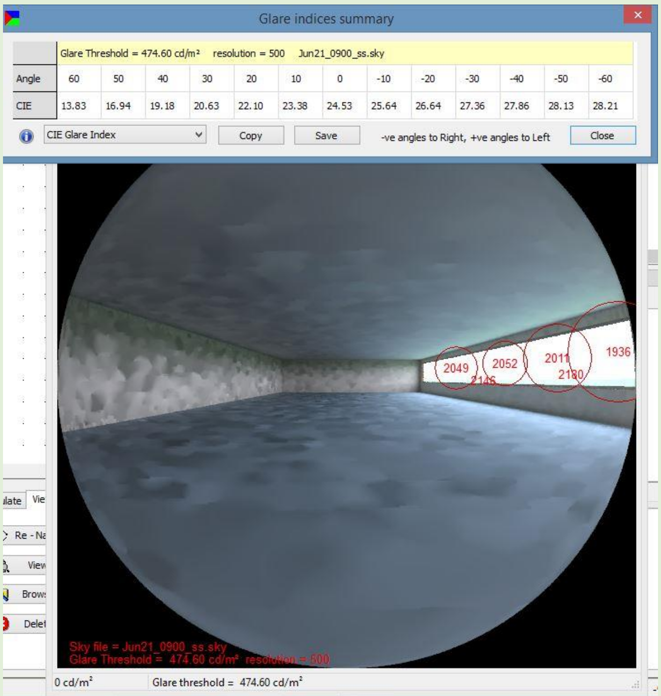
DGP



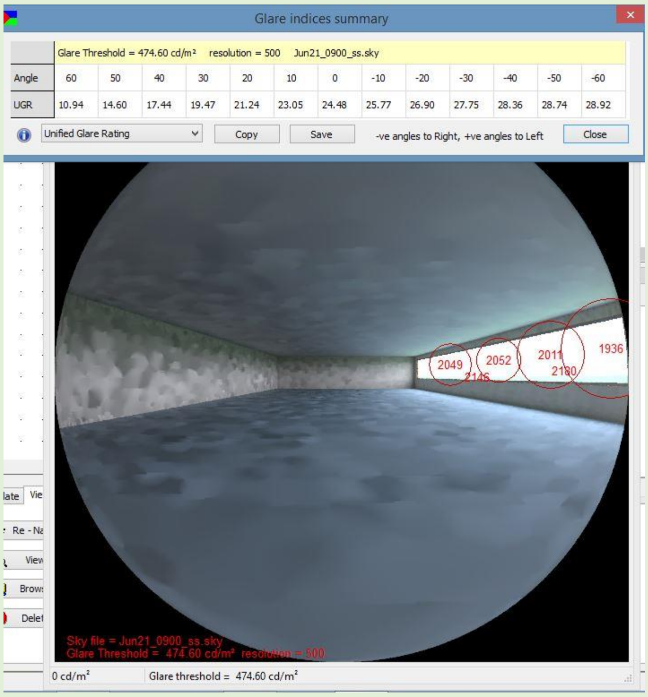
DGI

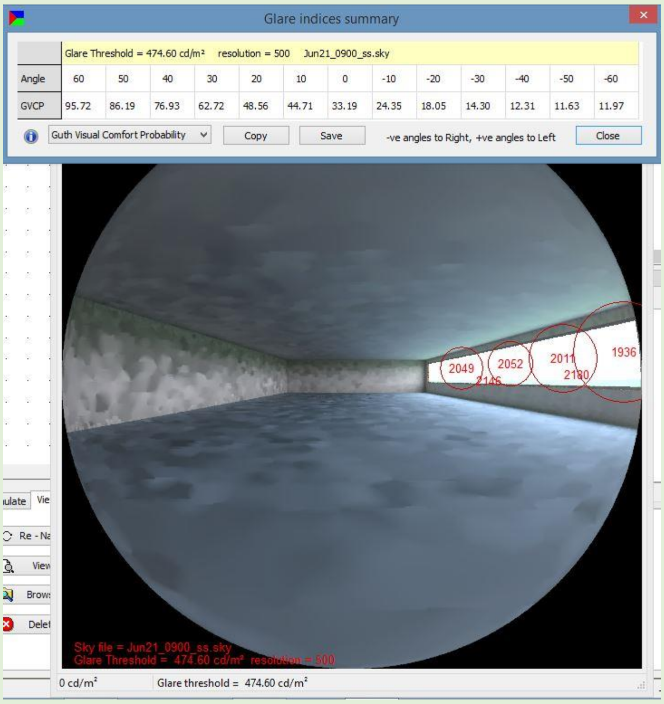
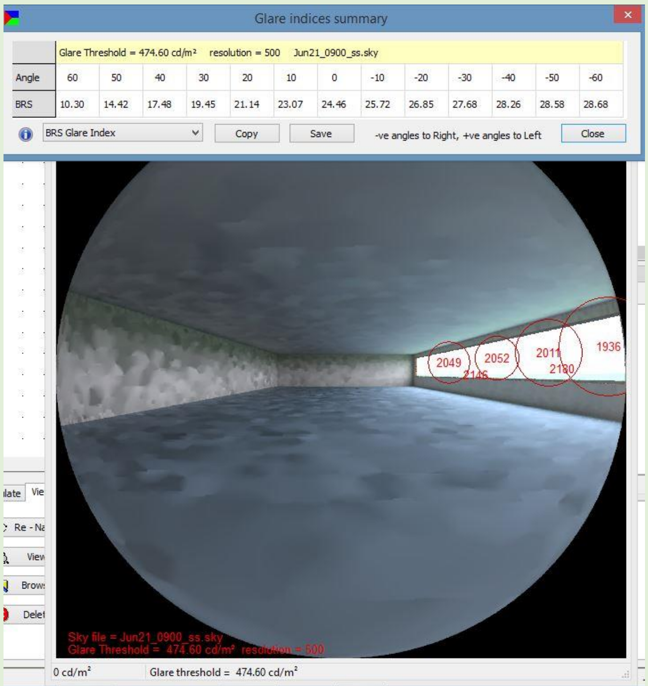


CGI



UGR

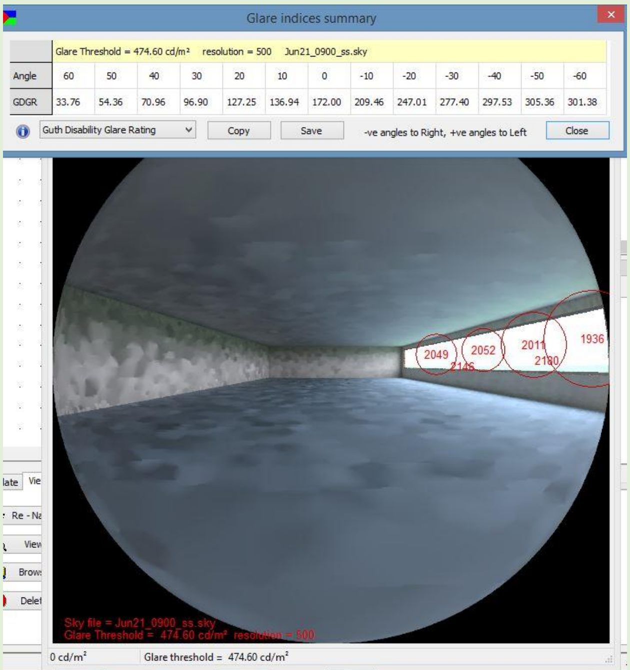


VCP	BRS
	

Glare indices summary
Glare Threshold = 474.60 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 95.72 86.19 76.93 62.72 48.56 44.71 33.19 24.35 18.05 14.30 12.31 11.63 11.97
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2049
2052
2011
1936
2145
2180
Sky file = Jun21_0900_ss.sky
0 cd/m²
Glare threshold = 474.60 cd/m²

Glare indices summary
Glare Threshold = 474.60 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 10.30 14.42 17.48 19.45 21.14 23.07 24.46 25.72 26.85 27.68 28.26 28.58 28.68
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2049
2052
2011
1936
2145
2180
Sky file = Jun21_0900_ss.sky
0 cd/m²
Glare threshold = 474.60 cd/m²

GDGR

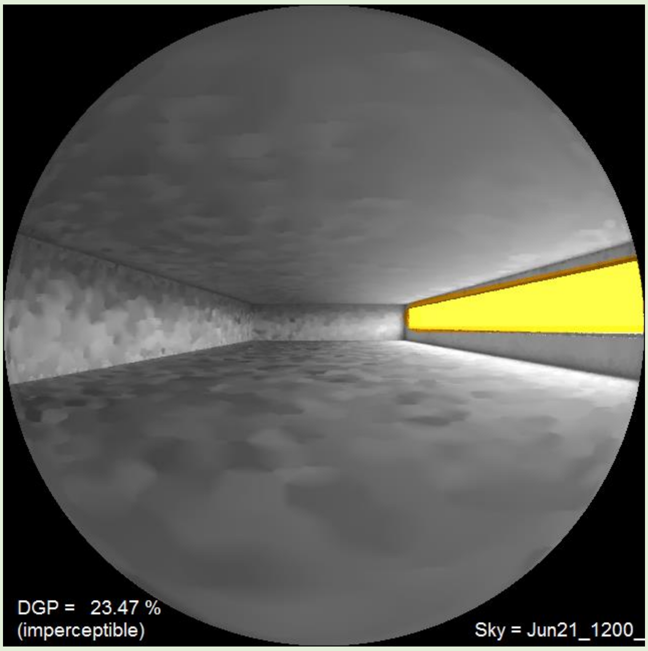


Glare indices summary
Glare Threshold = 474.60 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 33.76 54.36 70.96 96.90 127.25 136.94 172.00 209.46 247.01 277.40 297.53 305.36 301.38
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2049
2052
2011
1936
2145
2180
Sky file = Jun21_0900_ss.sky
0 cd/m²
Glare threshold = 474.60 cd/m²

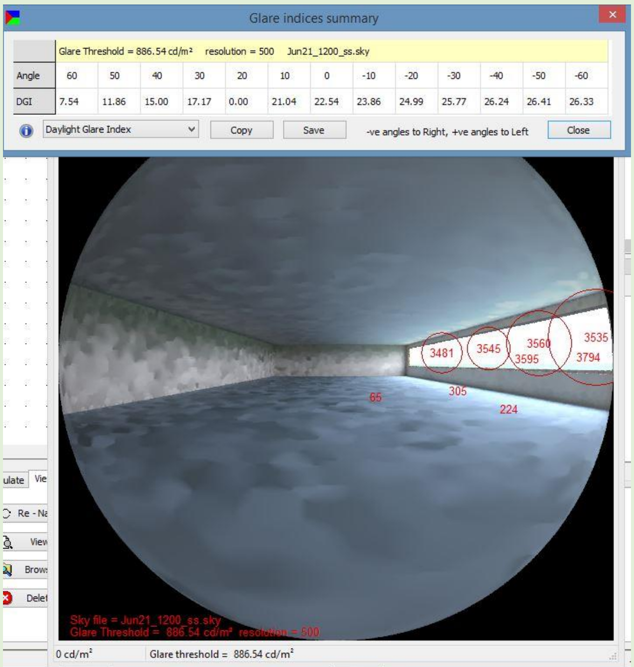
133: Daylight and Glare Analysis for Jun 21, with sunny sky, (S), (P6),(T12).

Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P6) (T12).

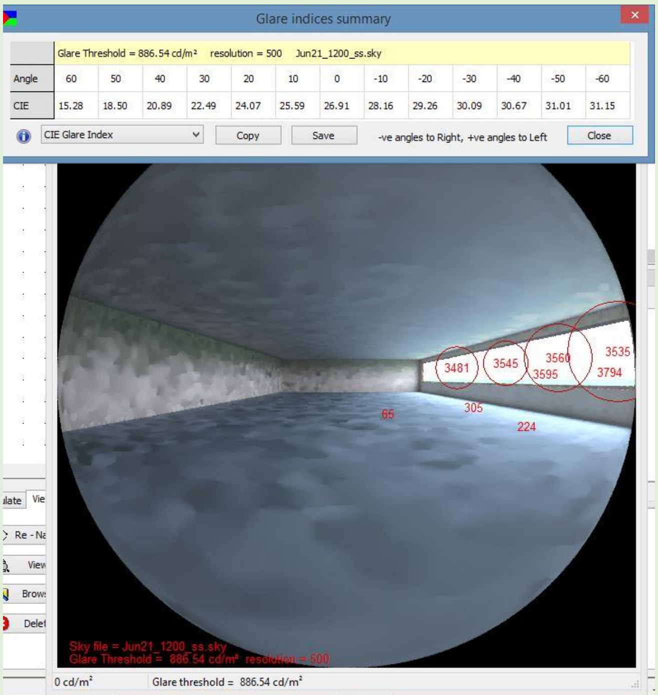
DGP



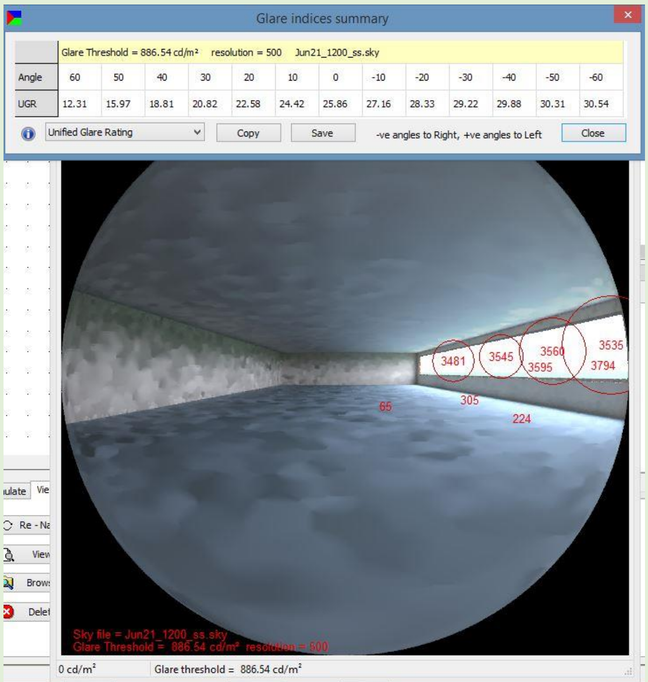
DGI



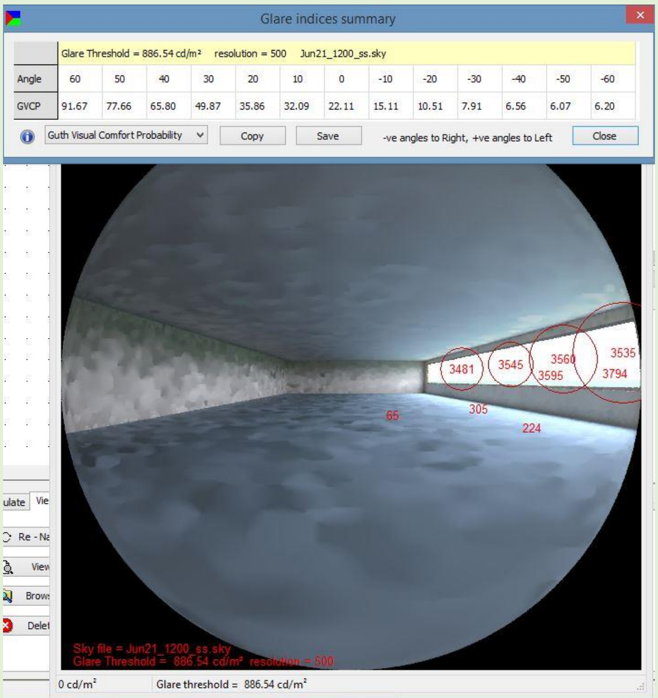
CGI



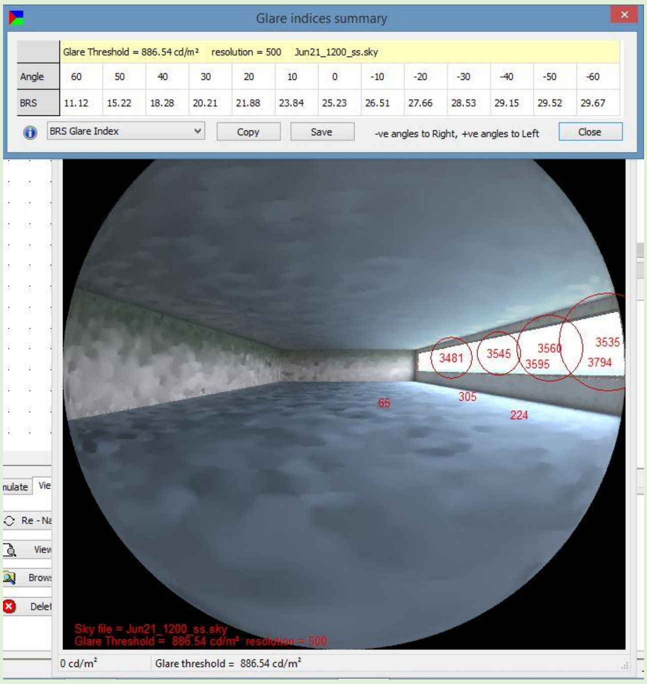
UGR



VCP


Glare indices summary
Glare Threshold = 886.54 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 91.67 77.66 65.80 49.87 35.86 32.09 22.11 15.11 10.51 7.91 6.56 6.07 6.20
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3481
3545
3560
3595
3535
3794
65
305
224
Sky file = Jun21_1200_ss.sky
Glare Threshold = 886.54 cd/m² resolution = 500
0 cd/m²
Glare threshold = 886.54 cd/m²

BRS


Glare indices summary
Glare Threshold = 886.54 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 11.12 15.22 18.28 20.21 21.88 23.84 25.23 26.51 27.66 28.53 29.15 29.52 29.67
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3481
3545
3560
3595
3535
3794
65
305
224
Sky file = Jun21_1200_ss.sky
Glare Threshold = 886.54 cd/m² resolution = 500
0 cd/m²
Glare threshold = 886.54 cd/m²

GDGR

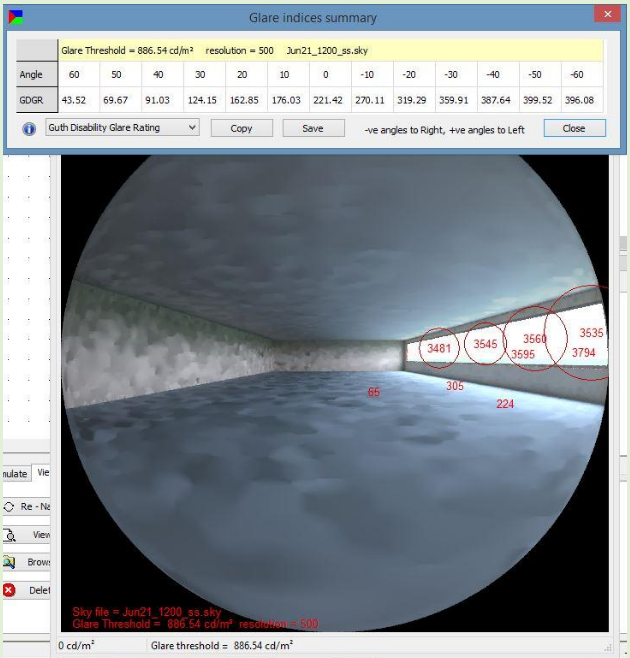
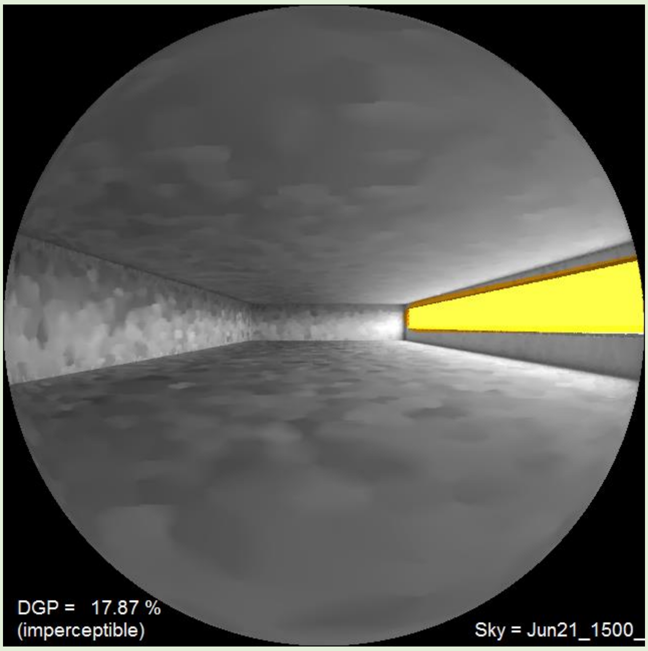

Glare indices summary
Glare Threshold = 886.54 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 43.52 69.67 91.03 124.15 162.85 176.03 221.42 270.11 319.29 359.91 387.64 399.52 396.08
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3481
3545
3560
3595
3535
3794
65
305
224
Sky file = Jun21_1200_ss.sky
Glare Threshold = 886.54 cd/m² resolution = 500
0 cd/m²
Glare threshold = 886.54 cd/m²

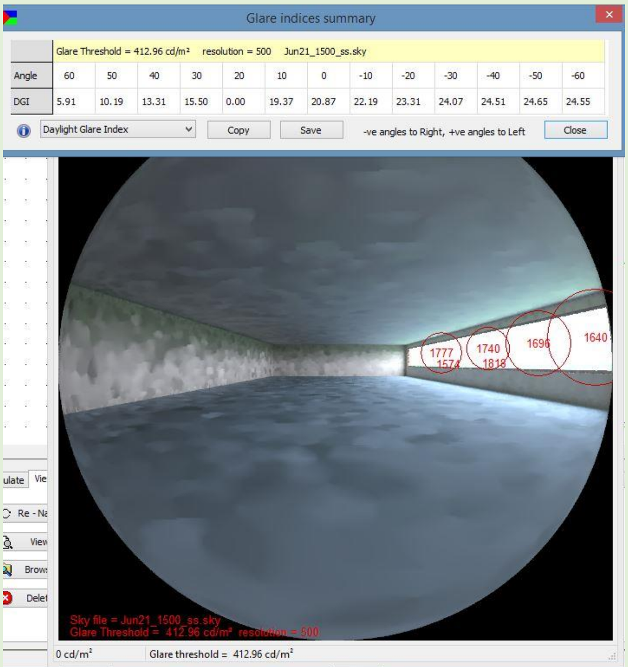
Table 134: Daylight and Glare Analysis for Jun 21, with sunny sky, (S), (P6),(T15).

Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P6) (T15).

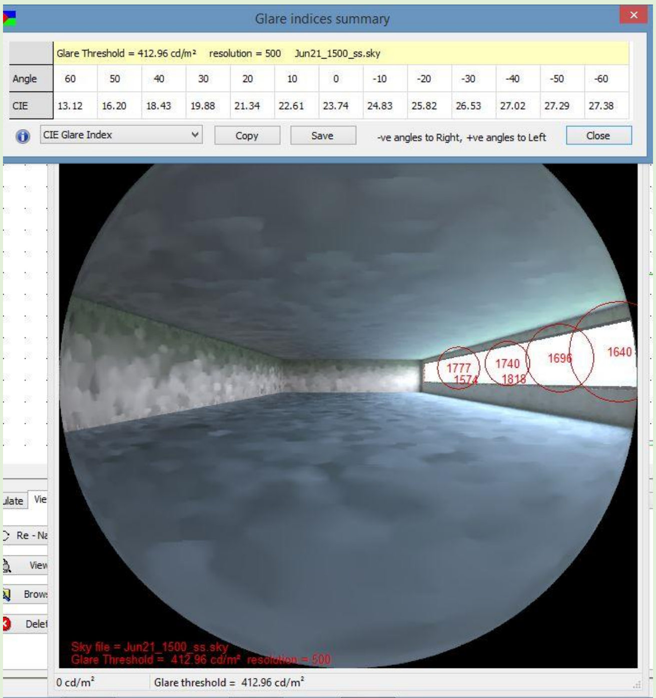
DGP



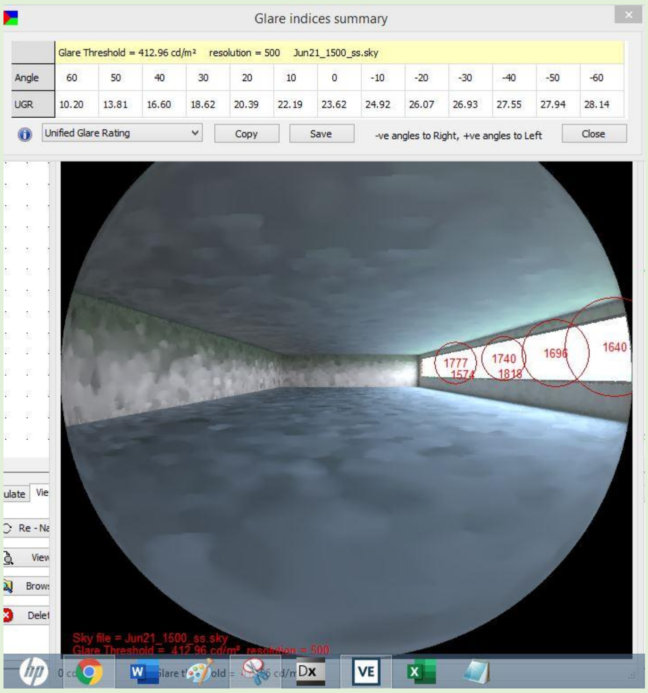
DGI



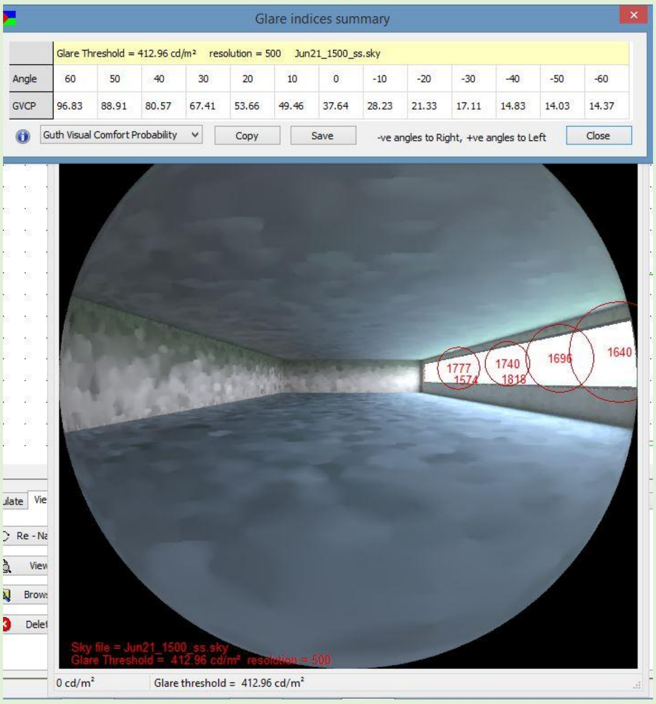
CGI

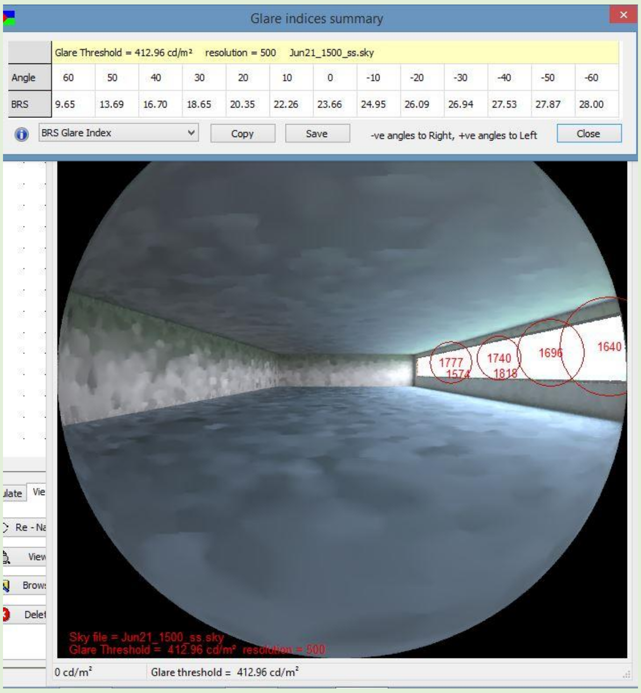


UGR

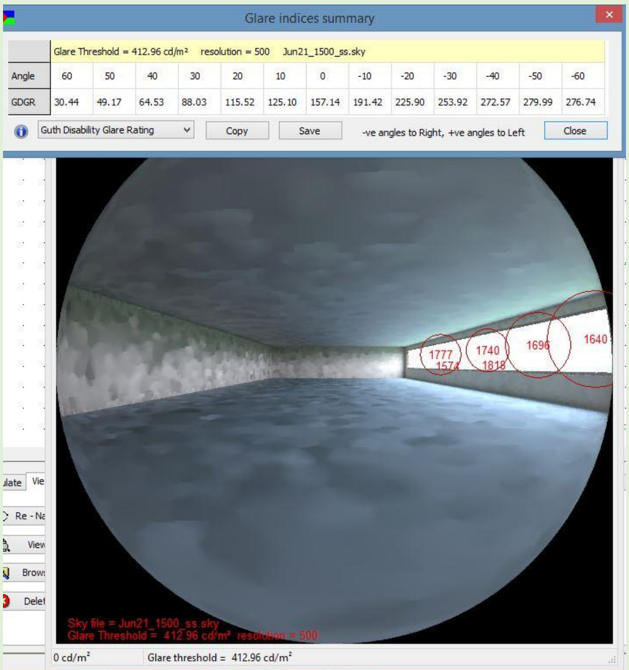


VCP	BRS


Glare indices summary
Glare Threshold = 412.96 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 96.83 88.91 80.57 67.41 53.66 49.46 37.64 28.23 21.33 17.11 14.83 14.03 14.37
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1777
1574
1740
1818
1696
1640
Sky file = Jun21_1500_ss.sky
Glare Threshold = 412.96 cd/m² resolution = 500
0 cd/m²
Glare threshold = 412.96 cd/m²


Glare indices summary
Glare Threshold = 412.96 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 9.65 13.69 16.70 18.65 20.35 22.26 23.66 24.95 26.09 26.94 27.53 27.87 28.00
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1777
1574
1740
1818
1696
1640
Sky file = Jun21_1500_ss.sky
Glare Threshold = 412.96 cd/m² resolution = 500
0 cd/m²
Glare threshold = 412.96 cd/m²

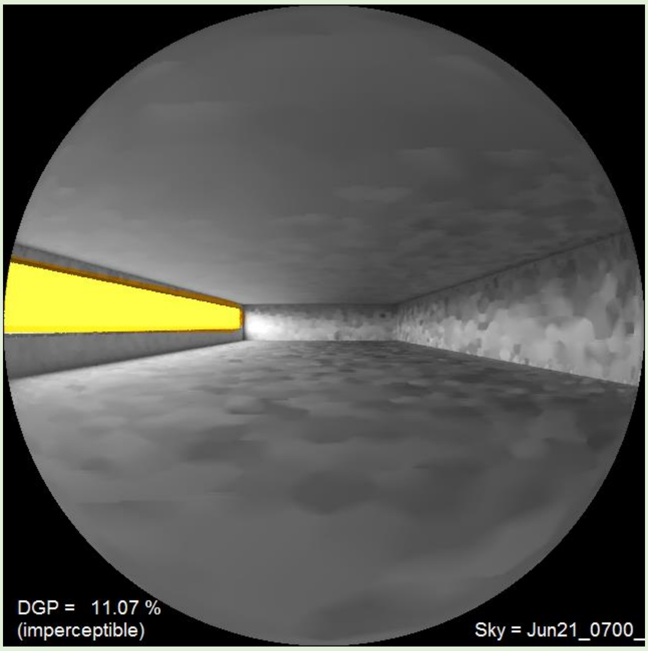
GDGR


Glare indices summary
Glare Threshold = 412.96 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 30.44 49.17 64.53 88.03 115.52 125.10 157.14 191.42 225.90 253.92 272.57 279.99 276.74
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1777
1574
1740
1818
1696
1640
Sky file = Jun21_1500_ss.sky
Glare Threshold = 412.96 cd/m² resolution = 500
0 cd/m²
Glare threshold = 412.96 cd/m²

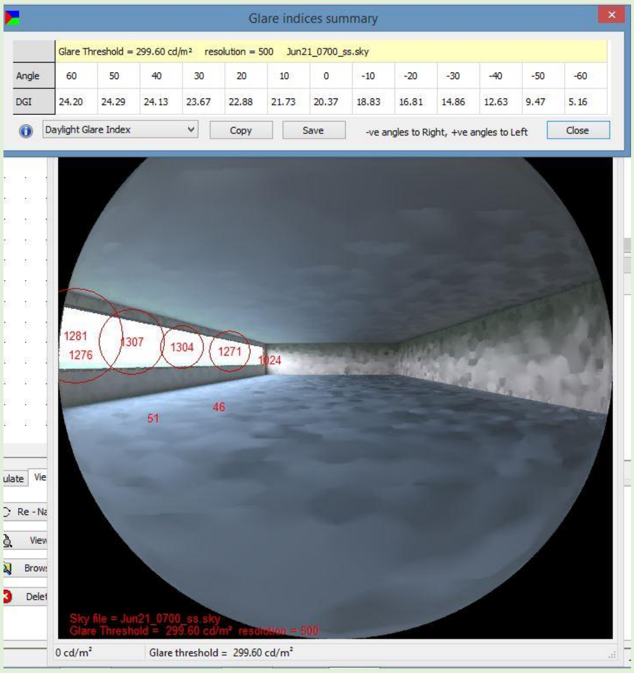
135: Daylight and Glare Analysis for Jun 21, with sunny sky, (S), (P5),(T7).

Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P5) (T7).

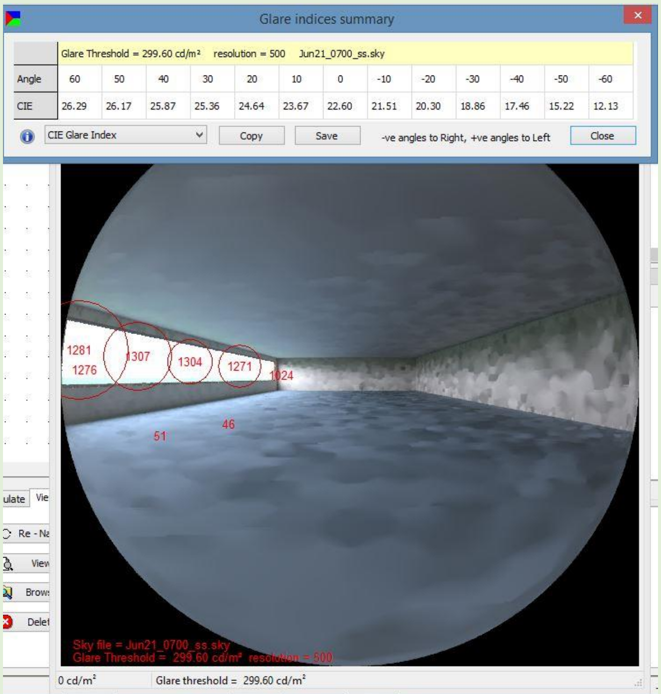
DGP



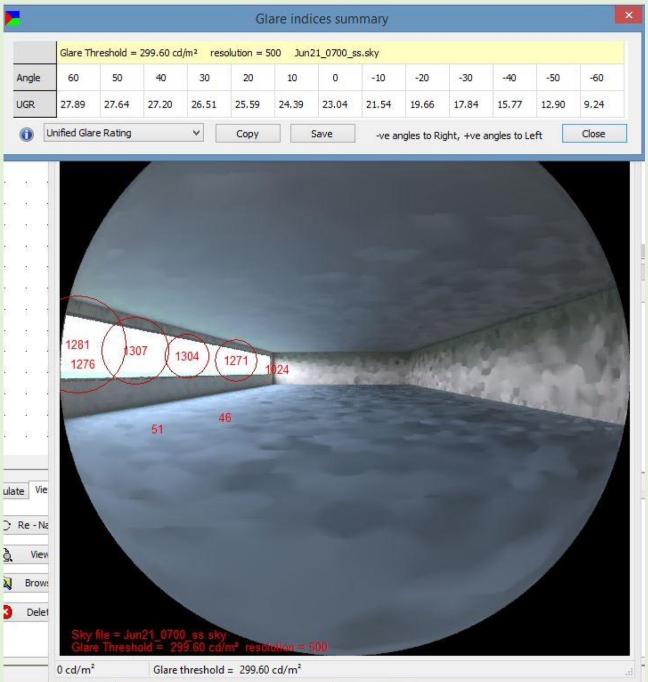
DGI



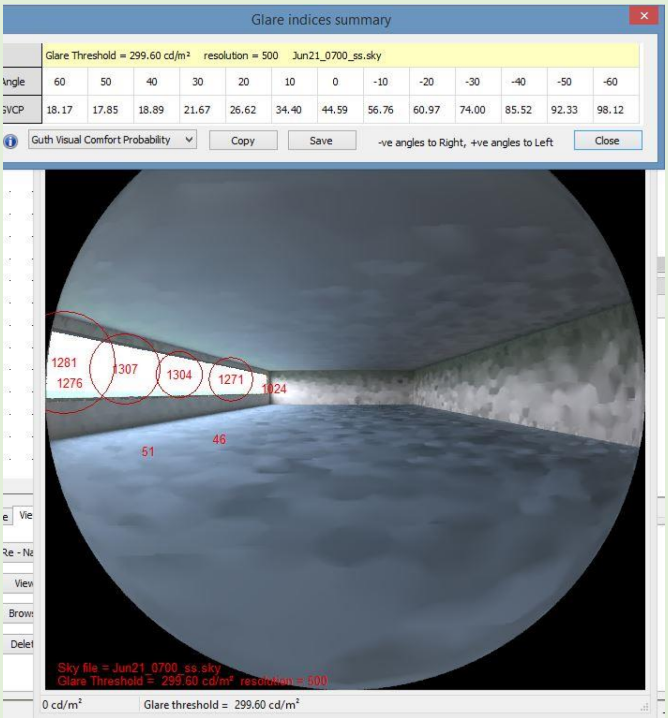
CGI



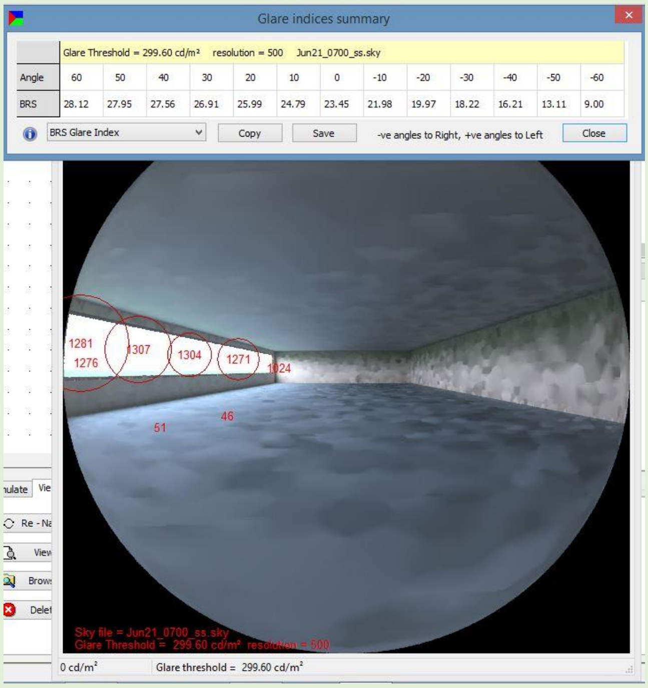
UGR



VCP


Glare indices summary
Glare Threshold = 299.60 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
VCP 18.17 17.85 18.89 21.67 26.62 34.40 44.59 56.76 60.97 74.00 85.52 92.33 98.12
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1281
1276
1307
1304
1271
1024
51
46
Sky file = Jun21_0700_ss.sky
Glare Threshold = 299.60 cd/m² resolution = 500
0 cd/m²
Glare threshold = 299.60 cd/m²

BRS


Glare indices summary
Glare Threshold = 299.60 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 28.12 27.95 27.56 26.91 25.99 24.79 23.45 21.98 19.97 18.22 16.21 13.11 9.00
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1281
1276
1307
1304
1271
1024
51
46
Sky file = Jun21_0700_ss.sky
Glare Threshold = 299.60 cd/m² resolution = 500
0 cd/m²
Glare threshold = 299.60 cd/m²

GDGR

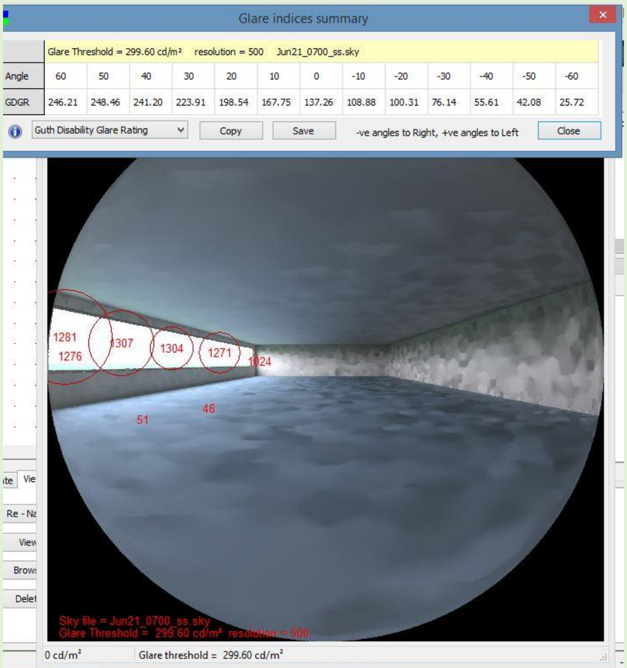
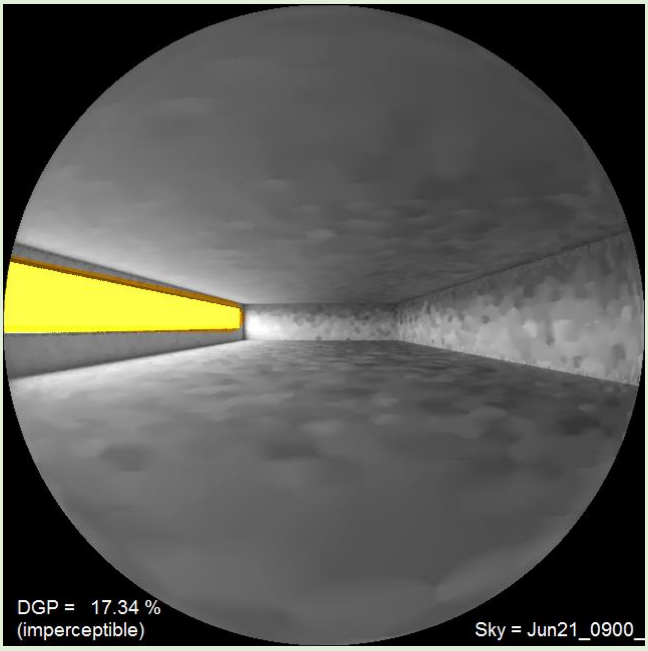

Glare indices summary
Glare Threshold = 299.60 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 246.21 248.46 241.20 223.91 198.54 167.75 137.26 108.88 100.31 76.14 55.61 42.08 25.72
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1281
1276
1307
1304
1271
1024
51
46
Sky file = Jun21_0700_ss.sky
Glare Threshold = 299.60 cd/m² resolution = 500
0 cd/m²
Glare threshold = 299.60 cd/m²

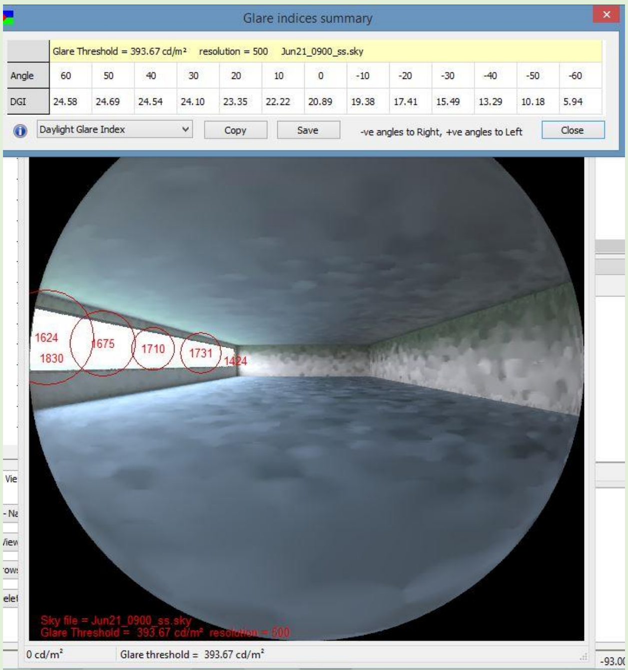
Table 136: Daylight and Glare Analysis for Jun 21, with sunny sky, (S), (P5),(T9).

Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P5) (T9).

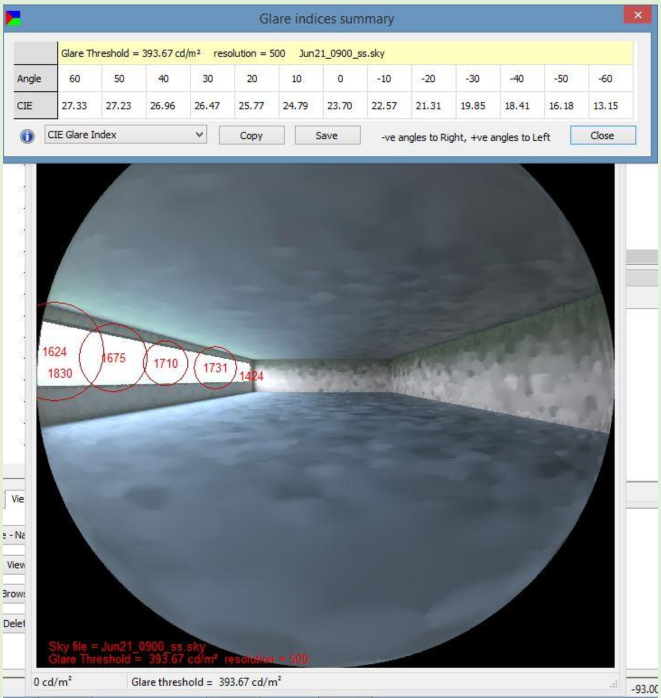
DGP



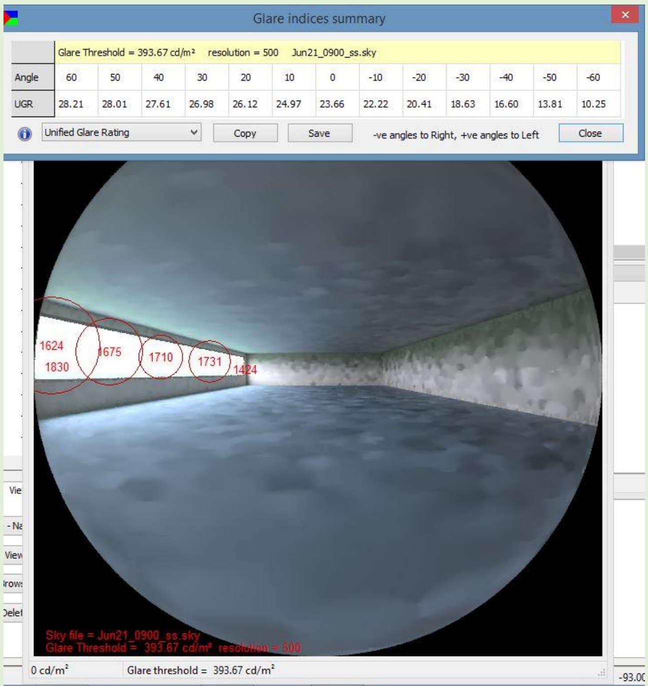
DGI



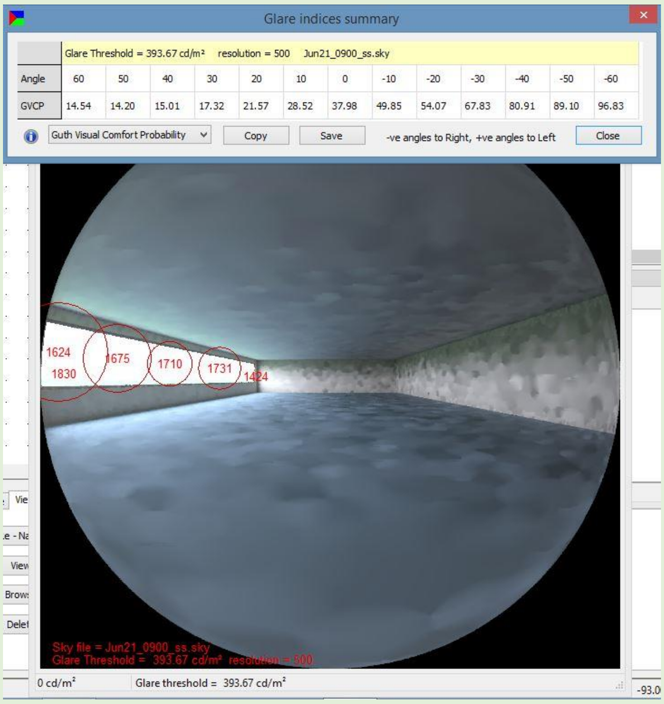
CGI



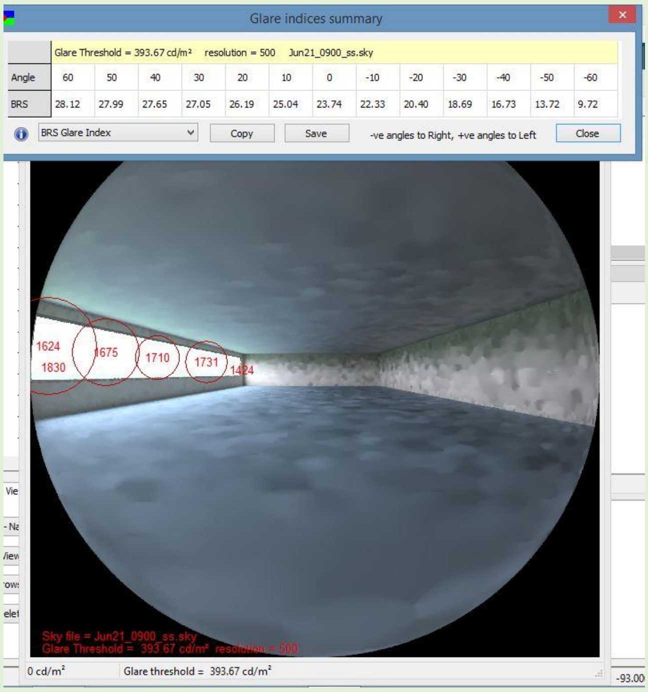
UGR



VCP


Glare indices summary
Glare Threshold = 393.67 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 14.54 14.20 15.01 17.32 21.57 28.52 37.98 49.85 54.07 67.83 80.91 89.10 96.83
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1624
1830
1675
1710
1731
1424
Sky file = Jun21_0900_ss.sky
Glare Threshold = 393.67 cd/m² resolution = 500
0 cd/m²
Glare threshold = 393.67 cd/m²

BRS


Glare indices summary
Glare Threshold = 393.67 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 28.12 27.99 27.65 27.05 26.19 25.04 23.74 22.33 20.40 18.69 16.73 13.72 9.72
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1624
1830
1675
1710
1731
1424
Sky file = Jun21_0900_ss.sky
Glare Threshold = 393.67 cd/m² resolution = 500
0 cd/m²
Glare threshold = 393.67 cd/m²

GDGR

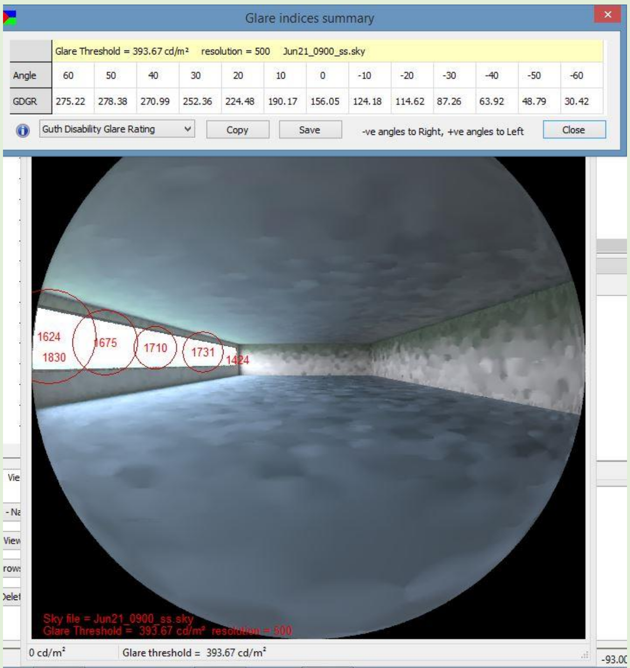
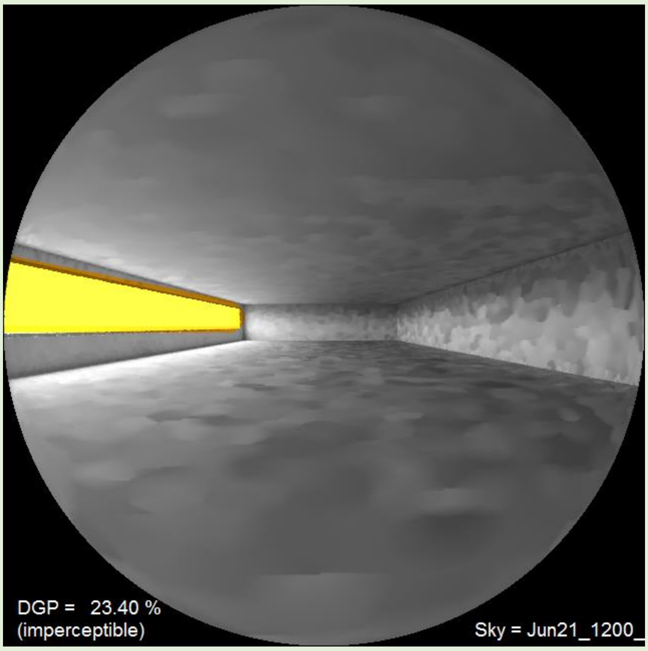

Glare indices summary
Glare Threshold = 393.67 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 275.22 278.38 270.99 252.36 224.48 190.17 156.05 124.18 114.62 87.26 63.92 48.79 30.42
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1624
1830
1675
1710
1731
1424
Sky file = Jun21_0900_ss.sky
Glare Threshold = 393.67 cd/m² resolution = 500
0 cd/m²
Glare threshold = 393.67 cd/m²

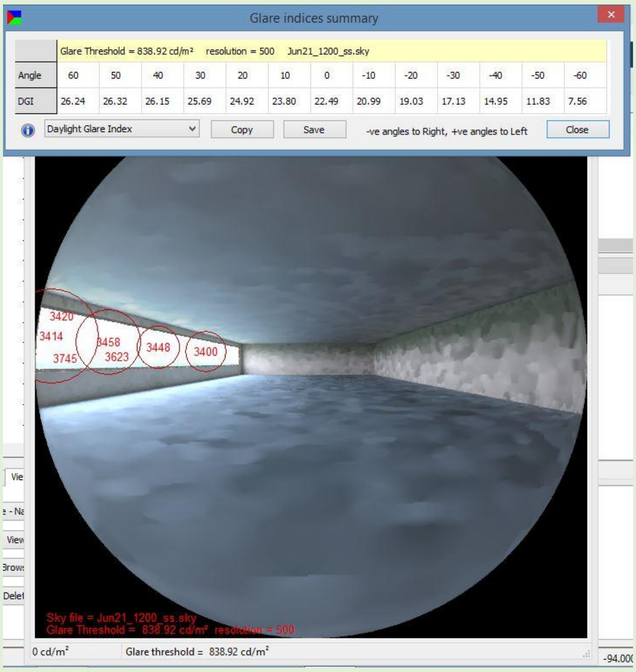
Table 137: Daylight and Glare Analysis for Jun 21, with sunny sky, (S), (P5),(T12).

Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P5) (T12).

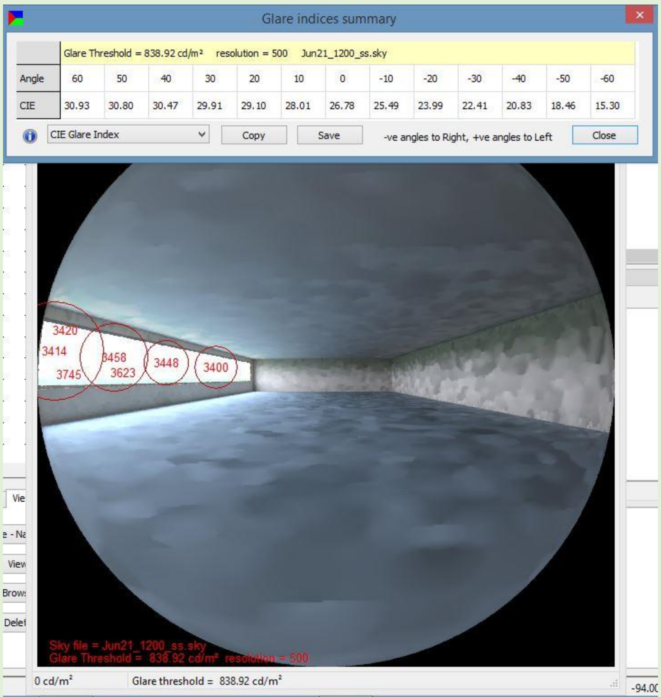
DGP



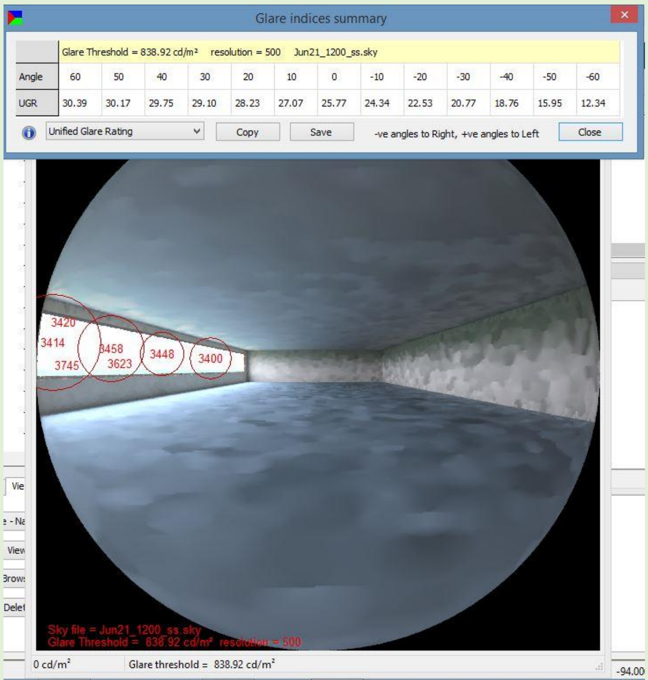
DGI



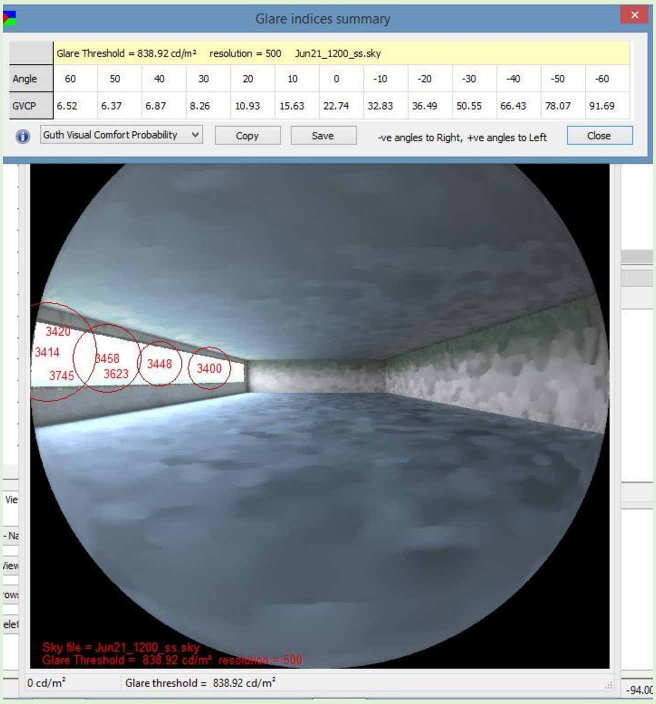
CGI



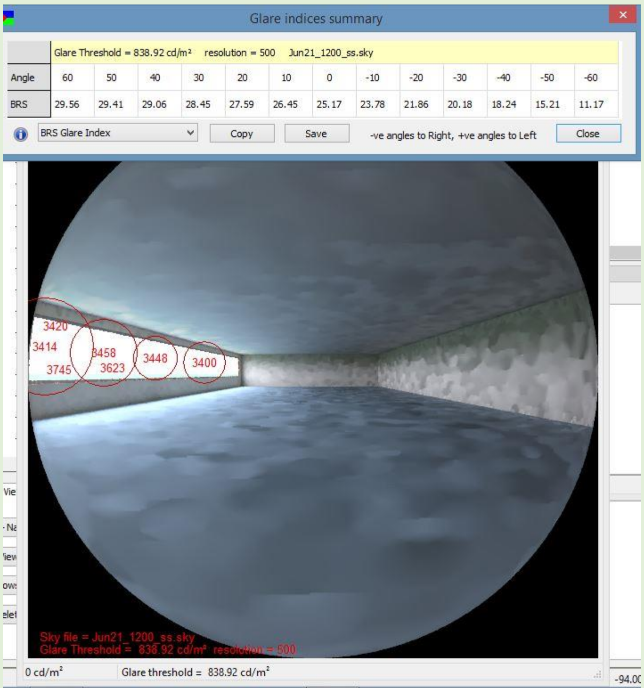
UGR



VCP


Glare indices summary
Glare Threshold = 838.92 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 6.52 6.37 6.87 8.26 10.93 15.63 22.74 32.83 36.49 50.55 66.43 78.07 91.69
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3420
3414
3745
3458
3623
3448
3400
Sky file = Jun21_1200_ss.sky
Glare Threshold = 838.92 cd/m² resolution = 500
0 cd/m²
Glare threshold = 838.92 cd/m²

BRS


Glare indices summary
Glare Threshold = 838.92 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 29.56 29.41 29.06 28.45 27.59 26.45 25.17 23.78 21.86 20.18 18.24 15.21 11.17
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3420
3414
3745
3458
3623
3448
3400
Sky file = Jun21_1200_ss.sky
Glare Threshold = 838.92 cd/m² resolution = 500
0 cd/m²
Glare threshold = 838.92 cd/m²

GDGR

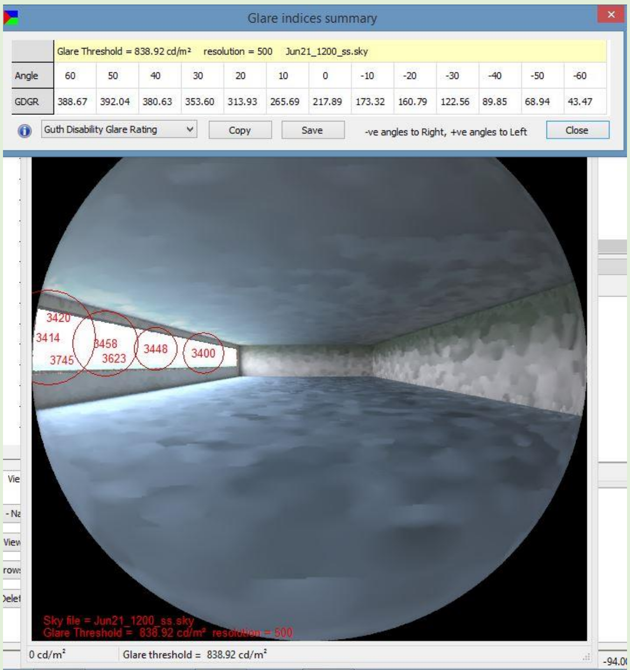
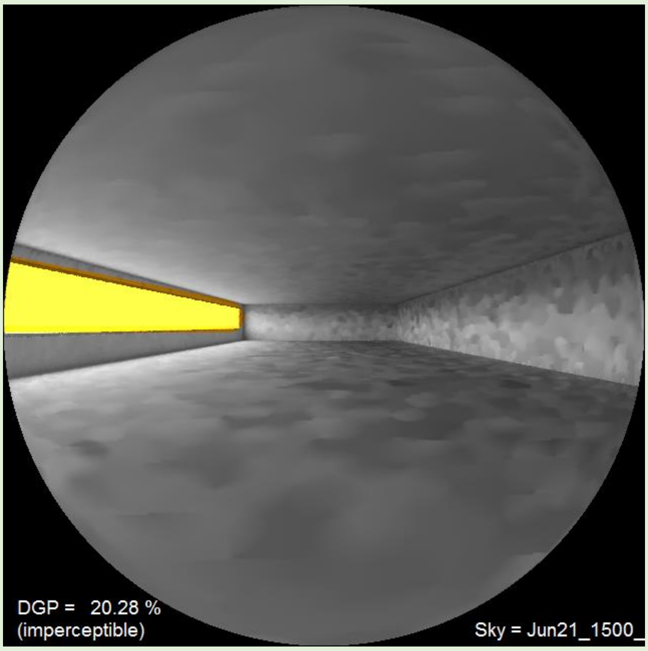
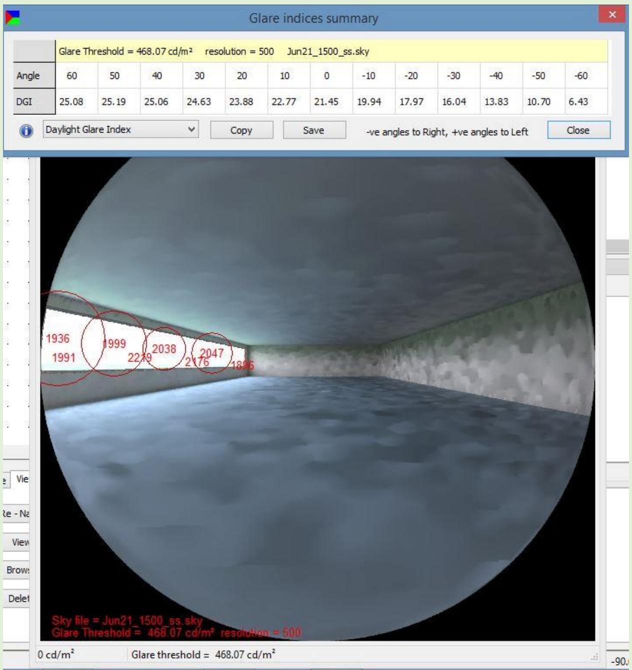
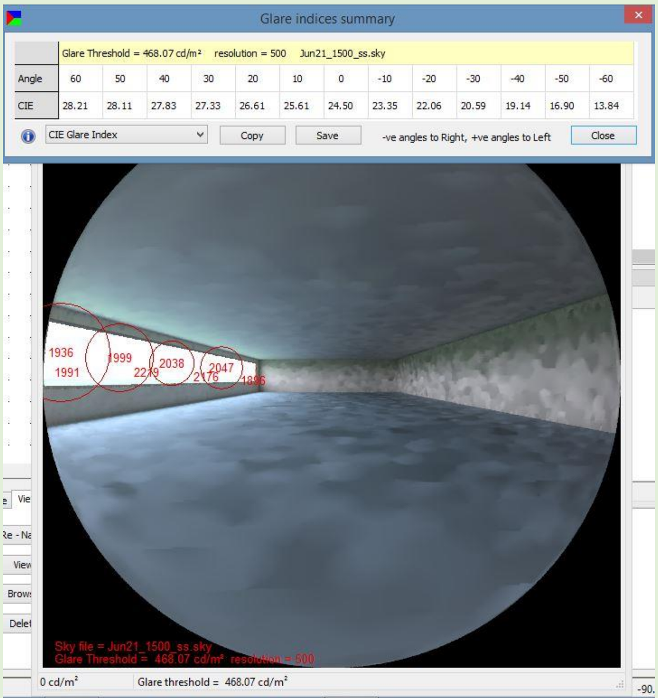
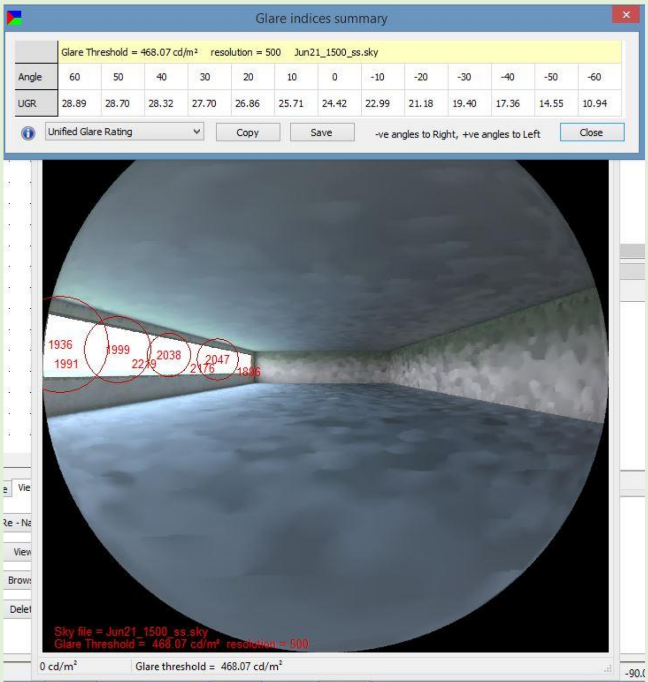
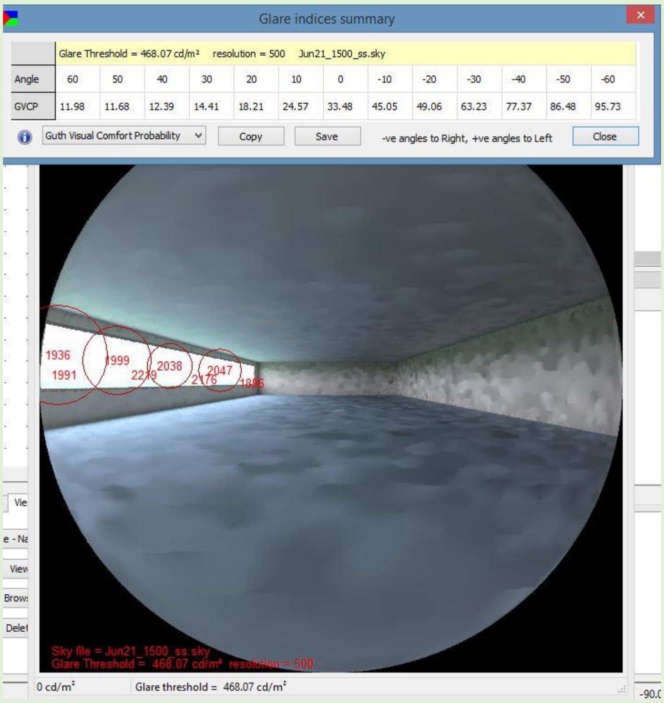

Glare indices summary
Glare Threshold = 838.92 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 388.67 392.04 380.63 353.60 313.93 265.69 217.89 173.32 160.79 122.56 89.85 68.94 43.47
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3420
3414
3745
3458
3623
3448
3400
Sky file = Jun21_1200_ss.sky
Glare Threshold = 838.92 cd/m² resolution = 500
0 cd/m²
Glare threshold = 838.92 cd/m²

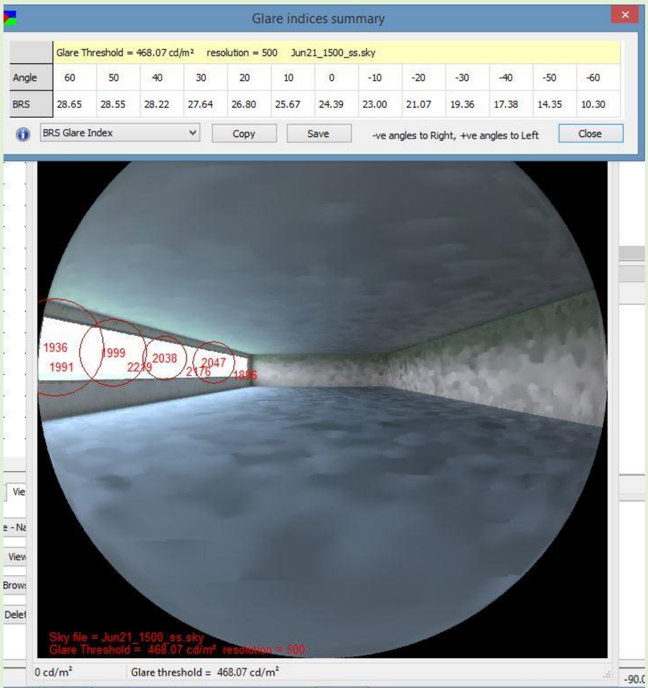
Table 138: Daylight and Glare Analysis for Jun 21, with sunny sky, (S), (P5),(T15).

Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P5) (T15).	
DGP	**DGI**
	
CGI	**UGR**
	

VCP


Glare indices summary
Glare Threshold = 468.07 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 11.98 11.68 12.39 14.41 18.21 24.57 33.48 45.05 49.06 63.23 77.37 86.48 95.73
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1936
1991
1999
2219
2038
2176
2047
1886
Sky file = Jun21_1500_ss.sky
Glare Threshold = 468.07 cd/m² resolution = 500
0 cd/m²
Glare threshold = 468.07 cd/m²

BRS


Glare indices summary
Glare Threshold = 468.07 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 28.65 28.55 28.22 27.64 26.80 25.67 24.39 23.00 21.07 19.36 17.38 14.35 10.30
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1936
1991
1999
2219
2038
2176
2047
1886
Sky file = Jun21_1500_ss.sky
Glare Threshold = 468.07 cd/m² resolution = 500
0 cd/m²
Glare threshold = 468.07 cd/m²

GDGR

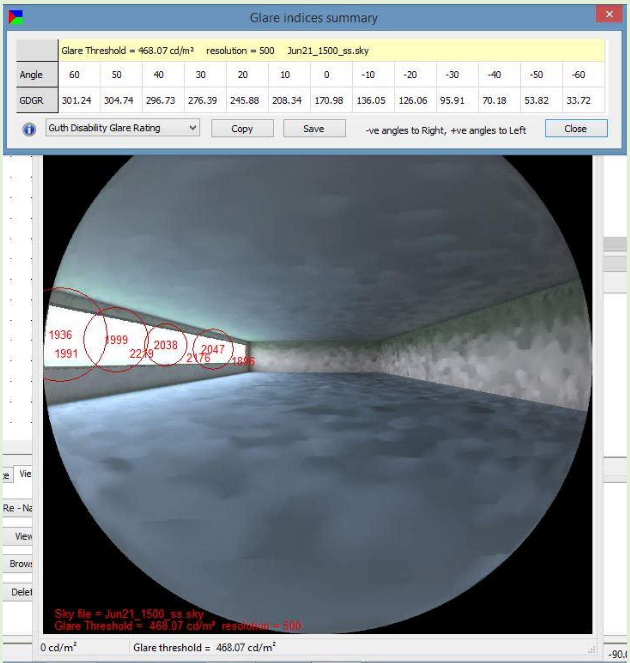
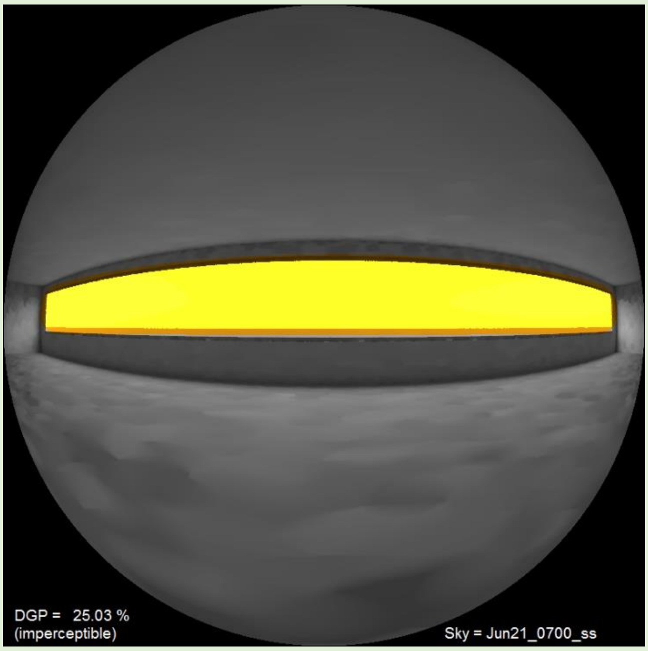

Glare indices summary
Glare Threshold = 468.07 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 301.24 304.74 296.73 276.39 245.88 208.34 170.98 136.05 126.06 95.91 70.18 53.82 33.72
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1936
1991
1999
2219
2038
2176
2047
1886
Sky file = Jun21_1500_ss.sky
Glare Threshold = 468.07 cd/m² resolution = 500
0 cd/m²
Glare threshold = 468.07 cd/m²

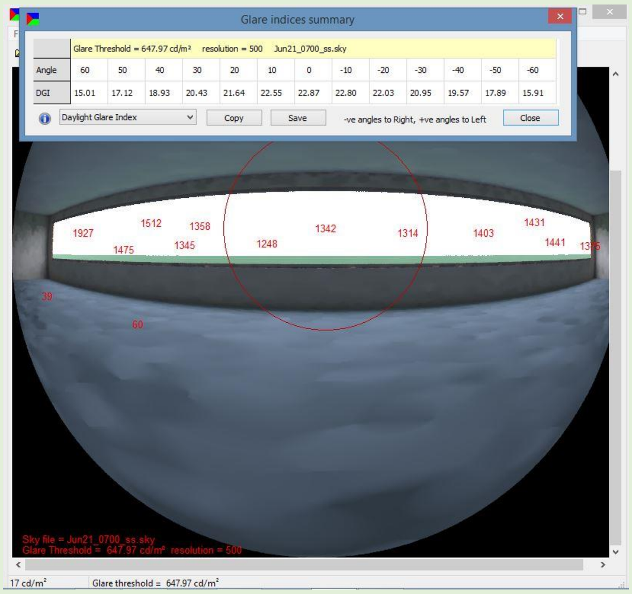
Table 139: Daylight and Glare Analysis for Jun 21, with sunny sky, (S), (P4),(T7).

Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P4) (T7).

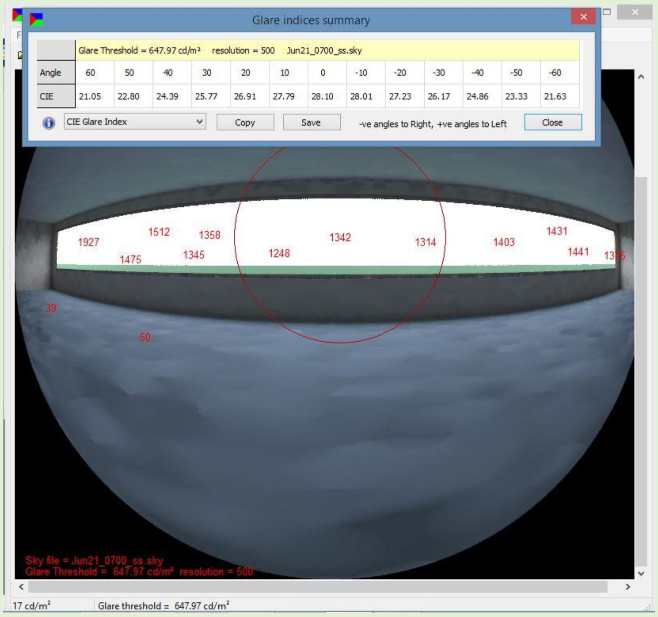
DGP



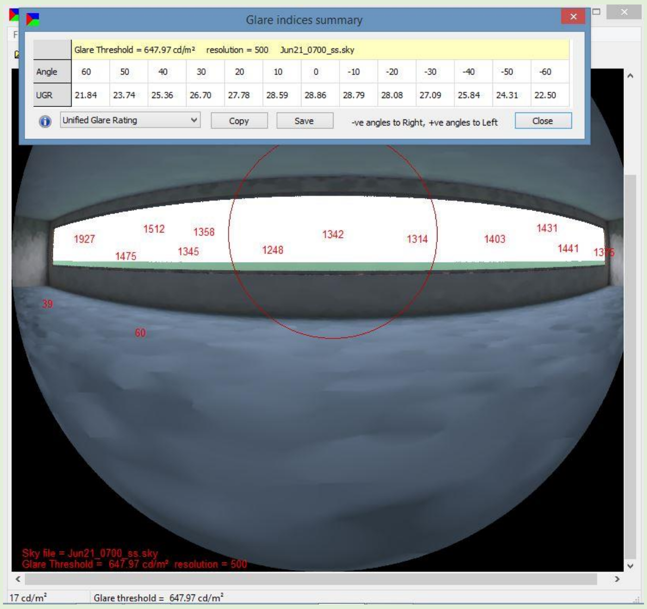
DGI

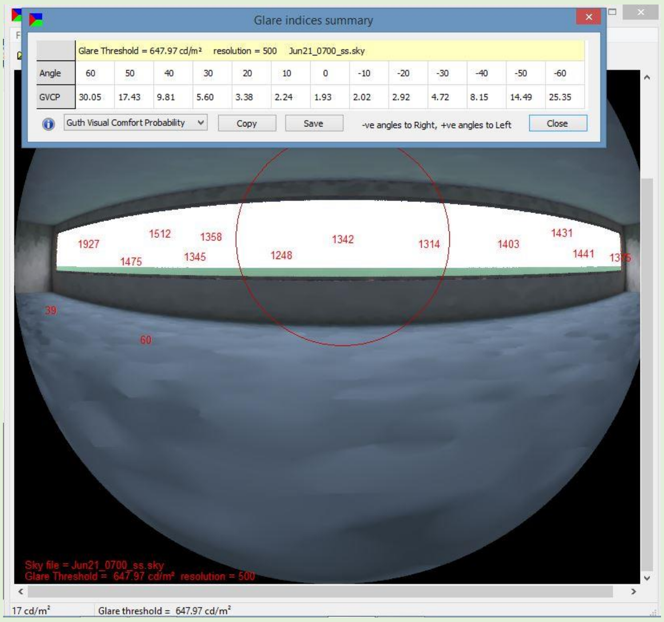
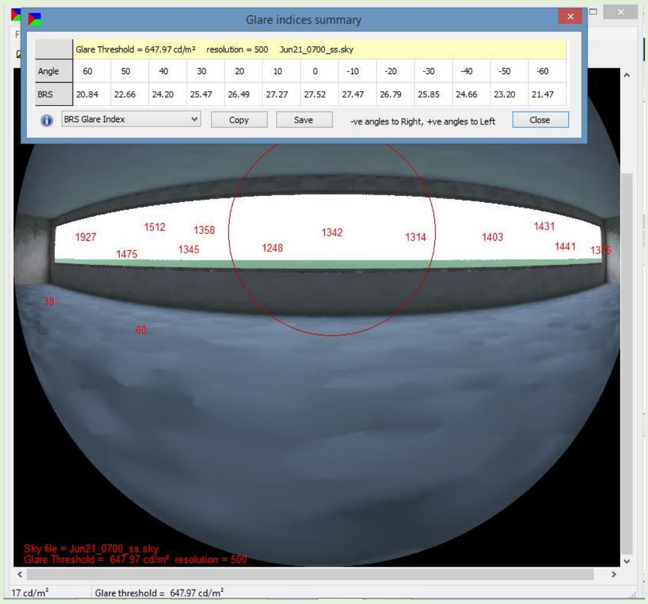


CGI



UGR

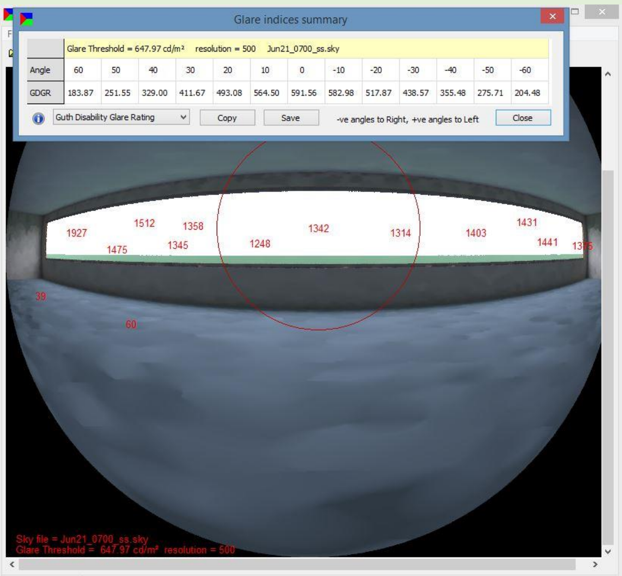


VCP	BRS
	

Glare indices summary
Glare Threshold = 647.97 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 30.05 17.43 9.81 5.60 3.38 2.24 1.93 2.02 2.92 4.72 8.15 14.49 25.35
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1927
1512
1358
1342
1314
1403
1431
1475
1345
1248
1441
39
60
Sky file = Jun21_0700_ss.sky
Glare Threshold = 647.97 cd/m² resolution = 500
17 cd/m²
Glare threshold = 647.97 cd/m²

Glare indices summary
Glare Threshold = 647.97 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 20.84 22.66 24.20 25.47 26.49 27.27 27.52 27.47 26.79 25.85 24.66 23.20 21.47
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1927
1512
1358
1342
1314
1403
1431
1475
1345
1248
1441
39
60
Sky file = Jun21_0700_ss.sky
Glare Threshold = 647.97 cd/m² resolution = 500
17 cd/m²
Glare threshold = 647.97 cd/m²

GDGR

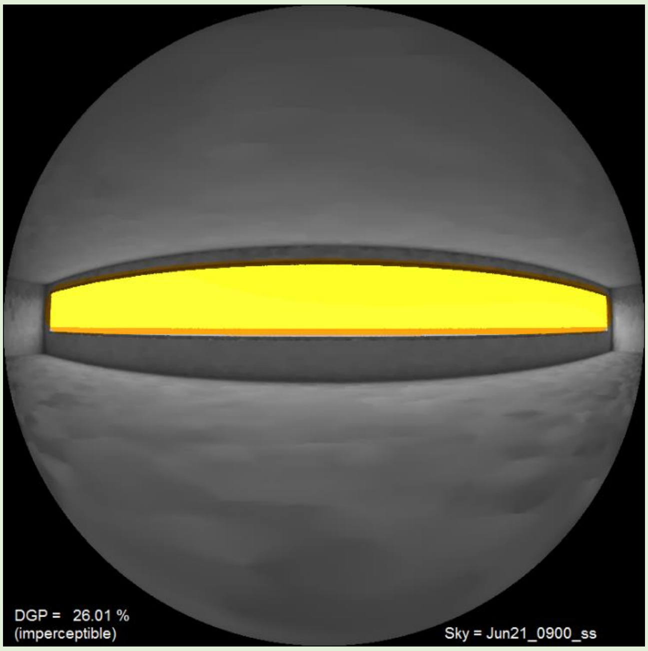


Glare indices summary
Glare Threshold = 647.97 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 183.87 251.55 329.00 411.67 493.08 564.50 591.56 582.98 517.87 438.57 355.48 275.71 204.48
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1927
1512
1358
1342
1314
1403
1431
1475
1345
1248
1441
39
60
Sky file = Jun21_0700_ss.sky
Glare Threshold = 647.97 cd/m² resolution = 500

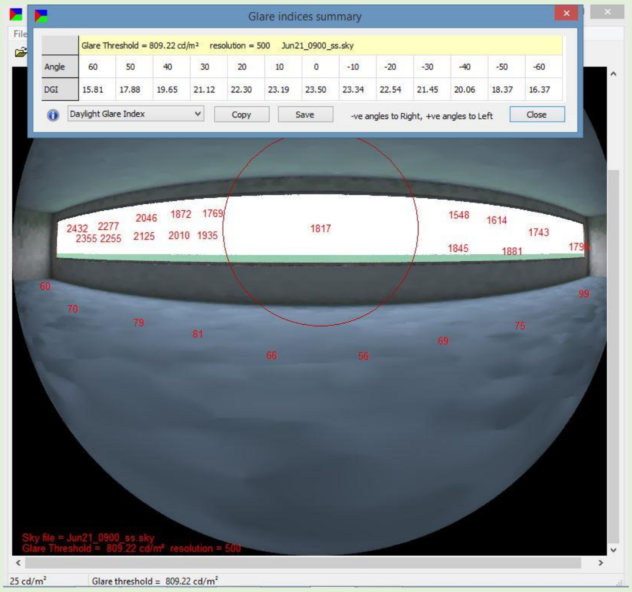
Table 140: Daylight and Glare Analysis for Jun 21, with sunny sky, (S), (P4),(T9).

Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P4) (T9).

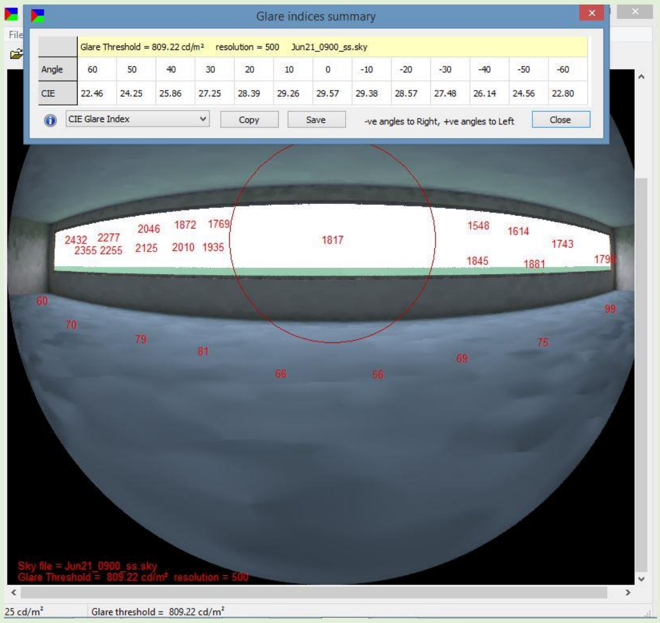
DGP



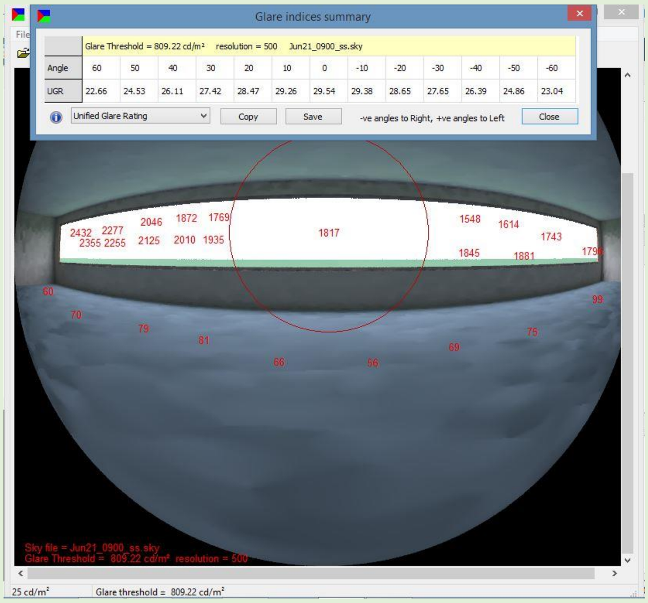
DGI



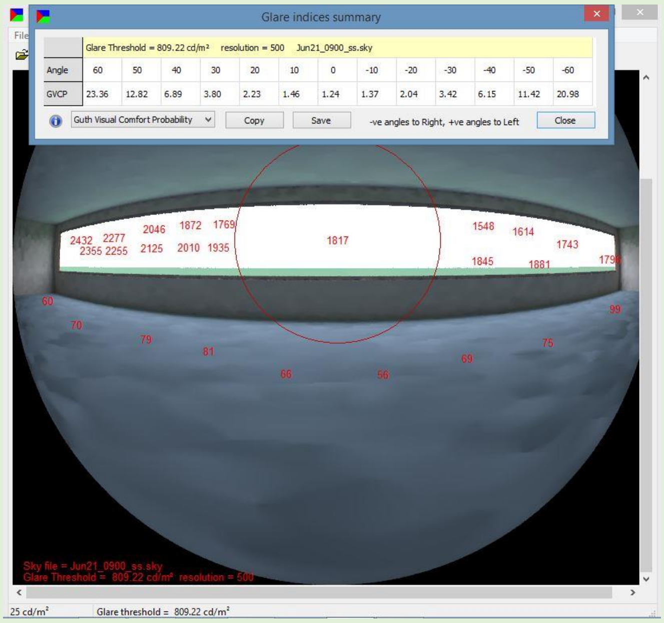
CGI



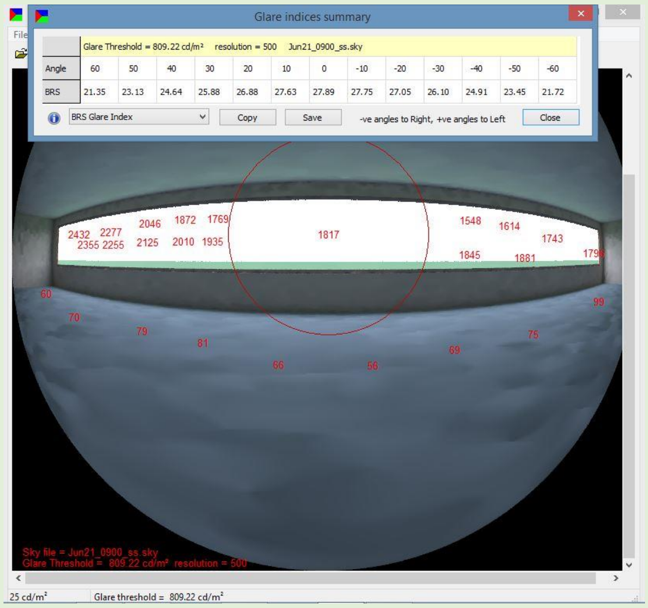
UGR



VCP


Glare indices summary
Glare Threshold = 809.22 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 23.36 12.82 6.89 3.80 2.23 1.46 1.24 1.37 2.04 3.42 6.15 11.42 20.98
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_0900_ss.sky
Glare Threshold = 809.22 cd/m² resolution = 500
25 cd/m²
Glare threshold = 809.22 cd/m²

BRS


Glare indices summary
Glare Threshold = 809.22 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 21.35 23.13 24.64 25.88 26.88 27.63 27.89 27.75 27.05 26.10 24.91 23.45 21.72
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_0900_ss.sky
Glare Threshold = 809.22 cd/m² resolution = 500
25 cd/m²
Glare threshold = 809.22 cd/m²

GDGR

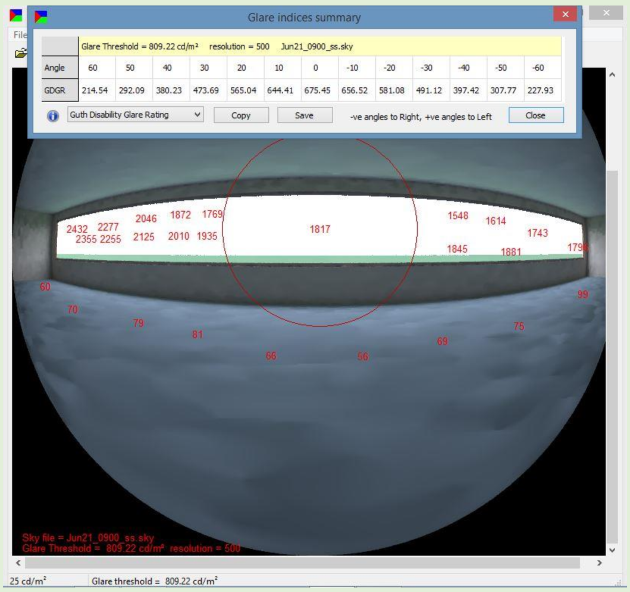
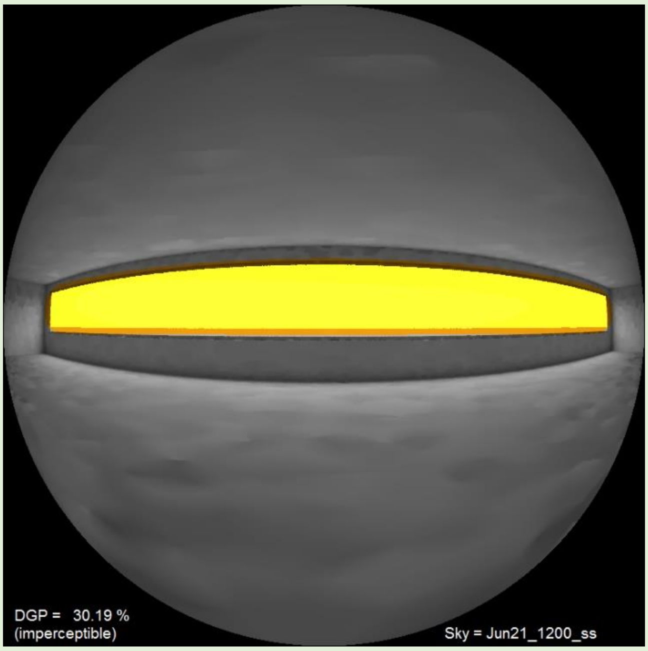
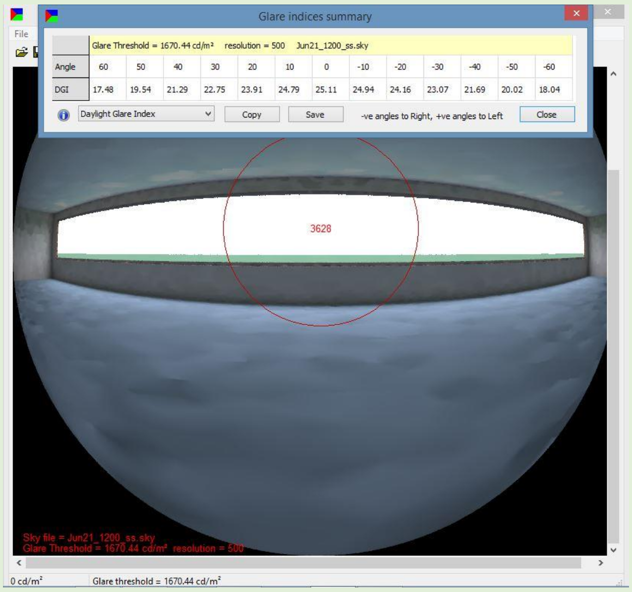
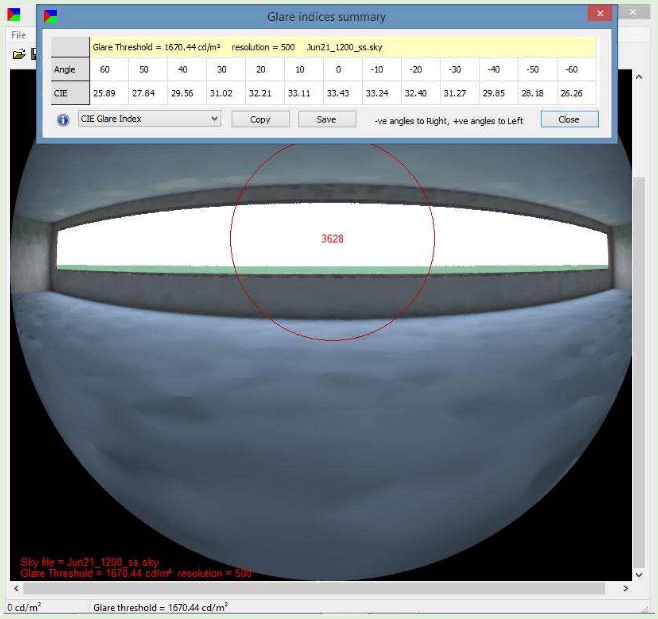
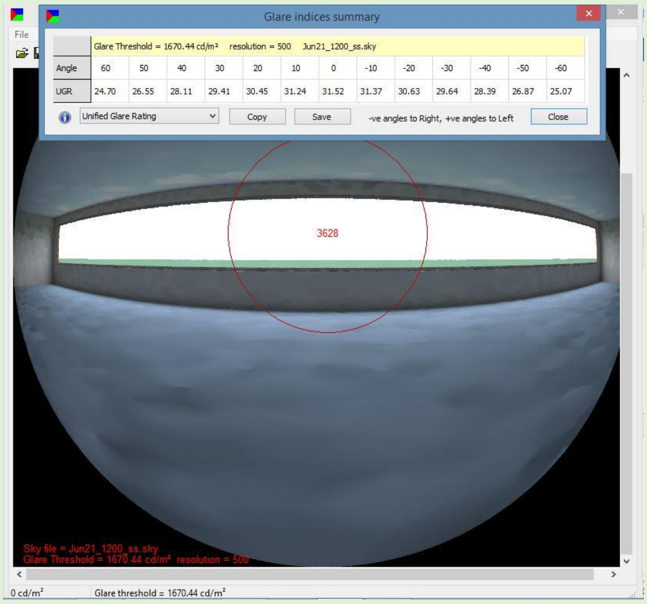
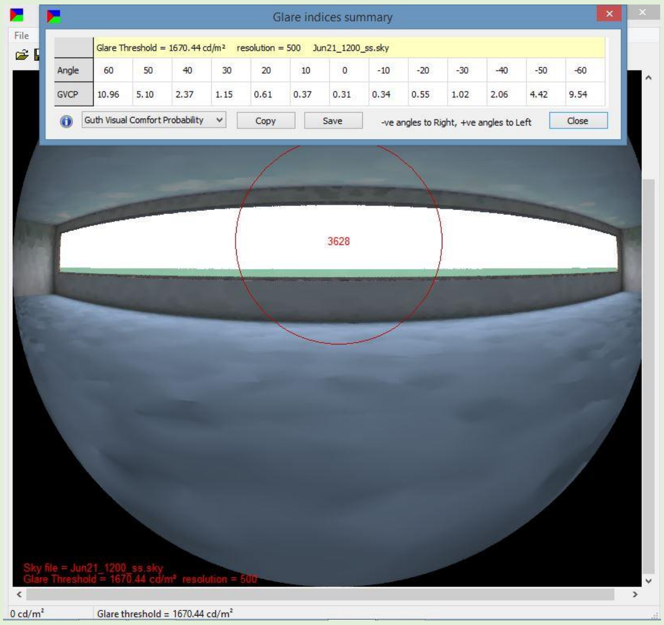

Glare indices summary
Glare Threshold = 809.22 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 214.54 292.09 380.23 473.69 565.04 644.41 675.45 656.52 581.08 491.12 397.42 307.77 227.93
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_0900_ss.sky
Glare Threshold = 809.22 cd/m² resolution = 500
25 cd/m²
Glare threshold = 809.22 cd/m²

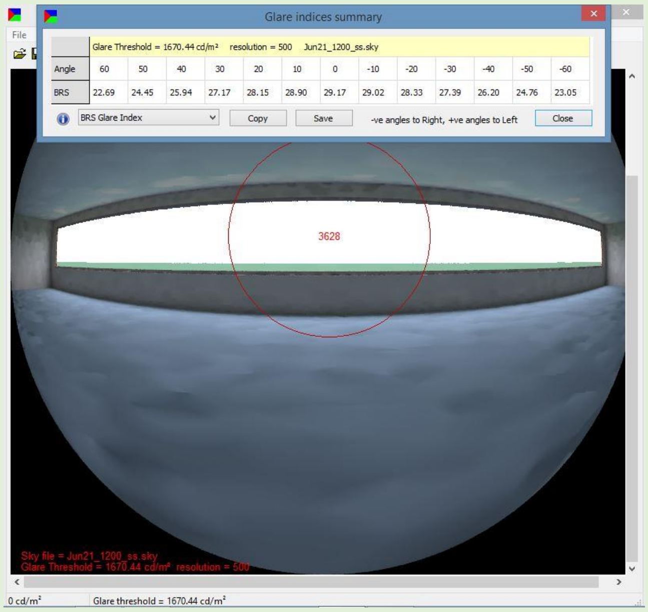
Table 141: Daylight and Glare Analysis for Jun 21, with sunny sky, (S), (P4),(T12).

Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P4) (T12).	
DGP	**DGI**
	
CGI	**UGR**
	

VCP


Glare indices summary
Glare Threshold = 1670.44 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 10.96 5.10 2.37 1.15 0.61 0.37 0.31 0.34 0.55 1.02 2.06 4.42 9.54
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3628
Sky file = Jun21_1200_ss.sky
Glare Threshold = 1670.44 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1670.44 cd/m²

BRS


Glare indices summary
Glare Threshold = 1670.44 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 22.69 24.45 25.94 27.17 28.15 28.90 29.17 29.02 28.33 27.39 26.20 24.76 23.05
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3628
Sky file = Jun21_1200_ss.sky
Glare Threshold = 1670.44 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1670.44 cd/m²

GDGR

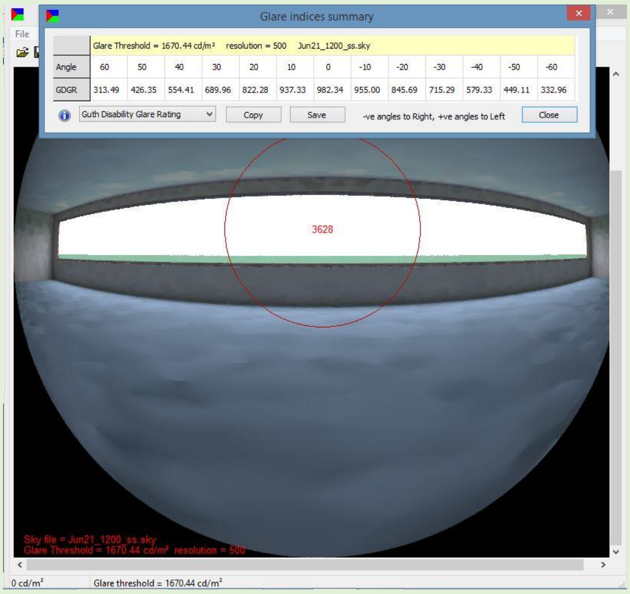
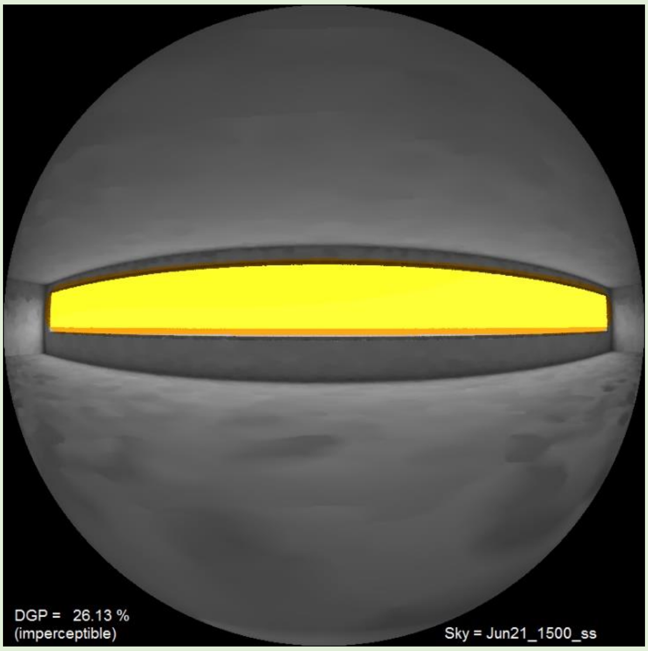

Glare indices summary
Glare Threshold = 1670.44 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 313.49 426.35 554.41 689.96 822.28 937.33 982.34 955.00 845.69 715.29 579.33 449.11 332.96
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3628
Sky file = Jun21_1200_ss.sky
Glare Threshold = 1670.44 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1670.44 cd/m²

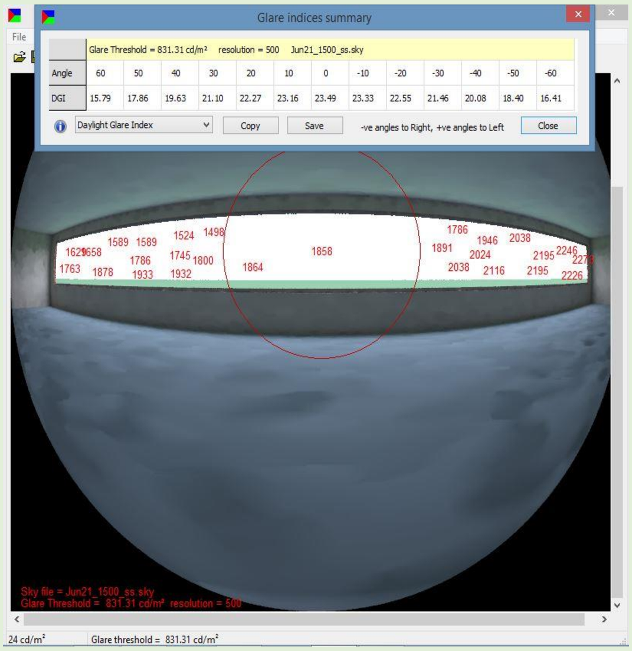
Table 142: Daylight and Glare Analysis for Jun 21, with sunny sky, (S), (P4),(T15).

Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P4) (T15).

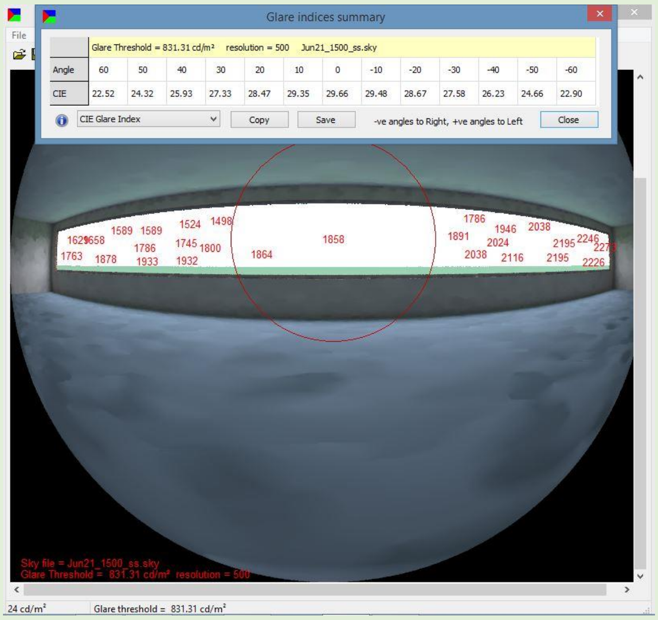
DGP



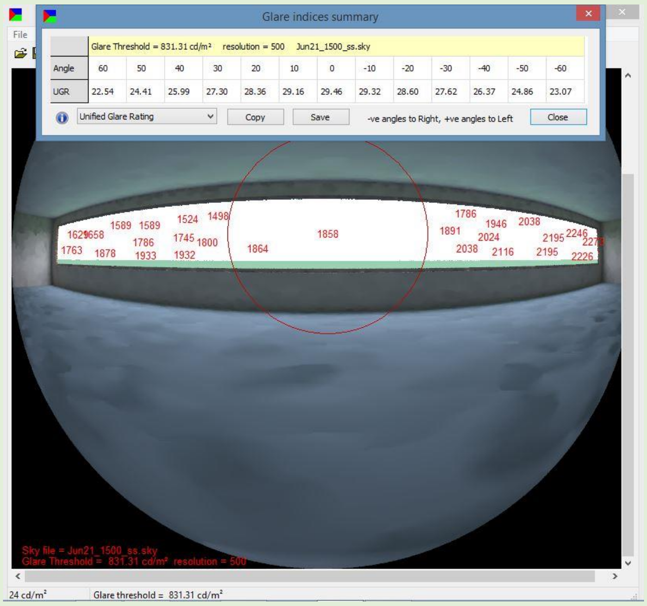
DGI

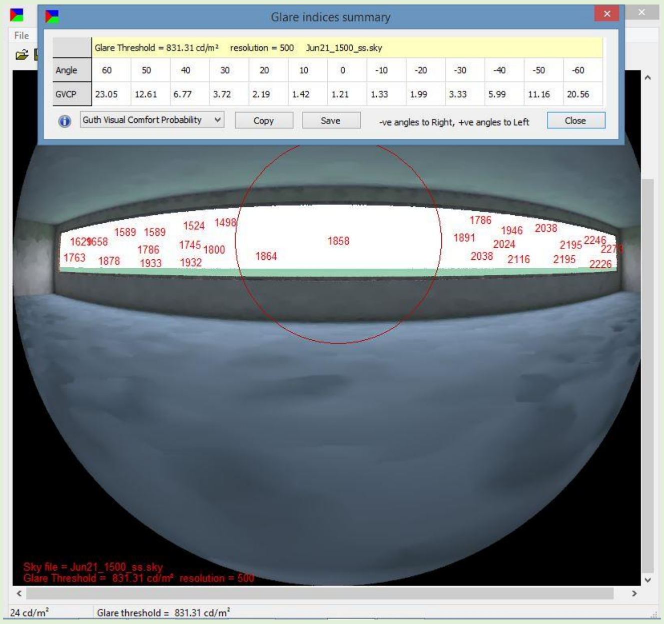
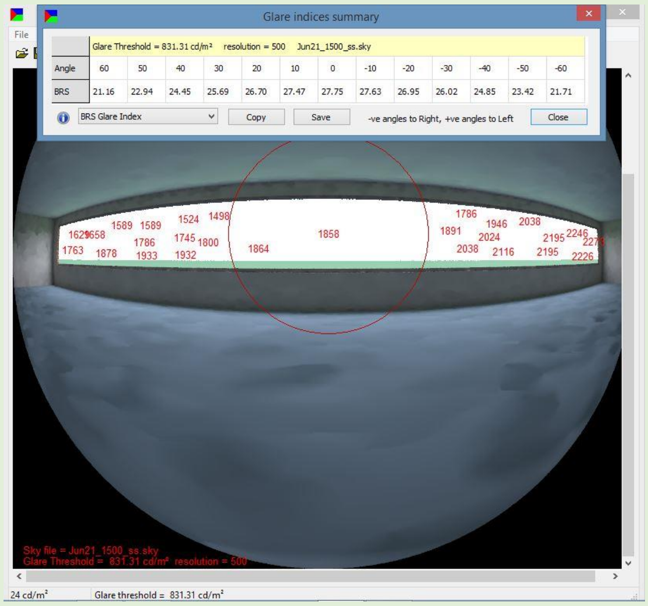


CGI



UGR

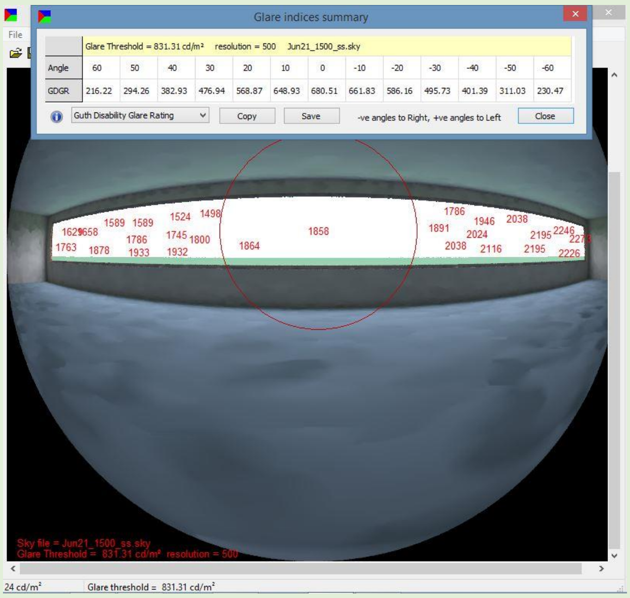


VCP	BRS
	

Glare indices summary
Glare Threshold = 831.31 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 23.05 12.61 6.77 3.72 2.19 1.42 1.21 1.33 1.99 3.33 5.99 11.16 20.56
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_1500_ss.sky
Glare Threshold = 831.31 cd/m² resolution = 500
Glare threshold = 831.31 cd/m²

Glare indices summary
Glare Threshold = 831.31 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 21.16 22.94 24.45 25.69 26.70 27.47 27.75 27.63 26.95 26.02 24.85 23.42 21.71
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_1500_ss.sky
Glare Threshold = 831.31 cd/m² resolution = 500
Glare threshold = 831.31 cd/m²

GDGR

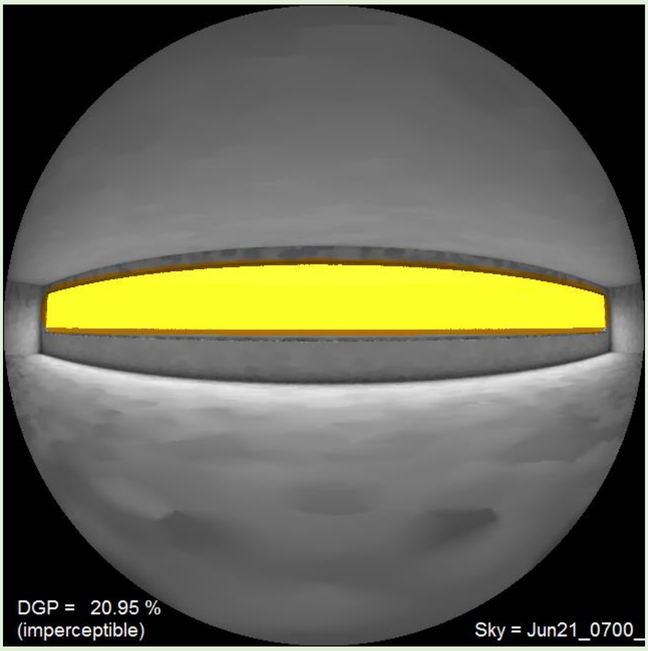


Glare indices summary
Glare Threshold = 831.31 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 216.22 294.26 382.93 476.94 568.87 648.93 680.51 661.83 586.16 495.73 401.39 311.03 230.47
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_1500_ss.sky
Glare Threshold = 831.31 cd/m² resolution = 500
Glare threshold = 831.31 cd/m²

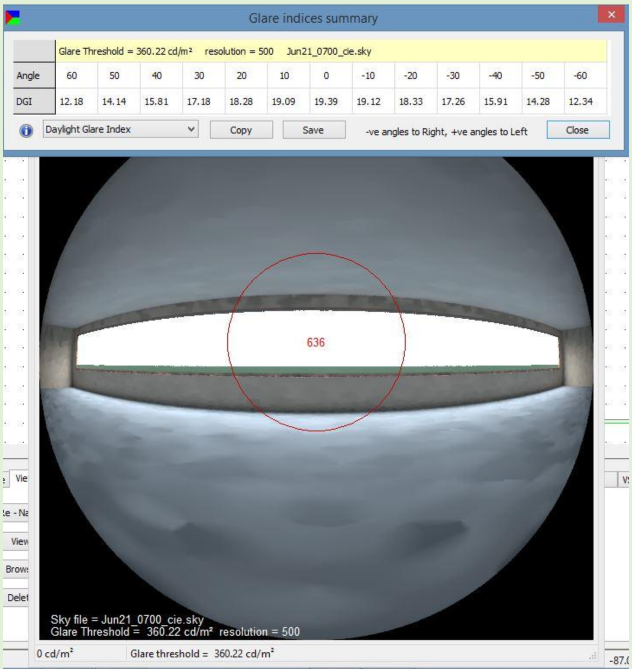
Table 143: Daylight and Glare Analysis for Jun 21, with overcast sky, (S), (P4),(T7).

Daylight and Glare Analysis for Jun 21, (overcast sky), (S), (P4) (T7).

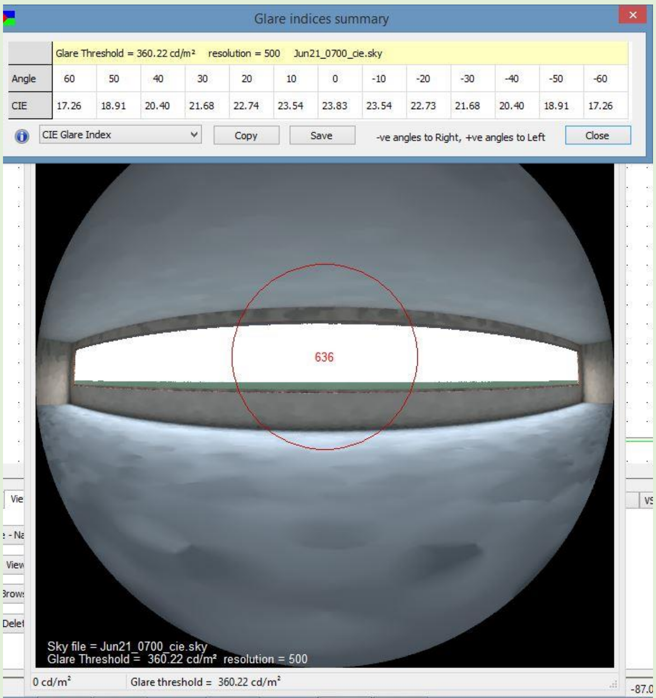
DGP



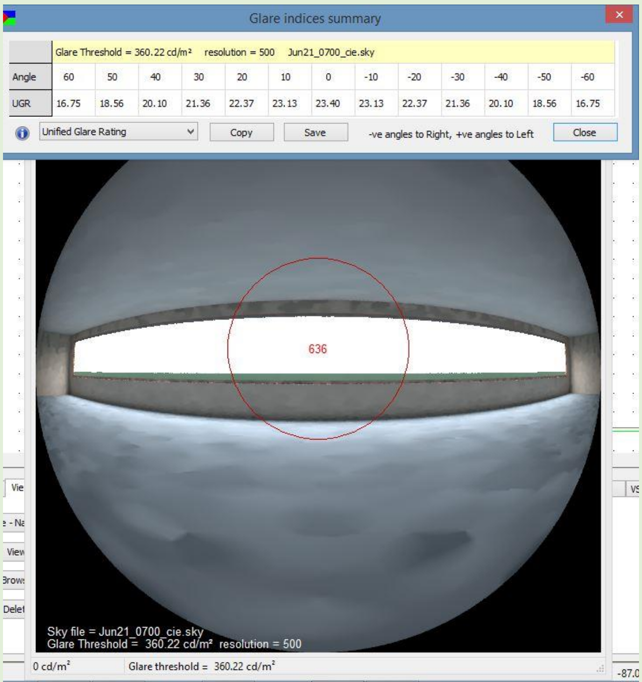
DGI

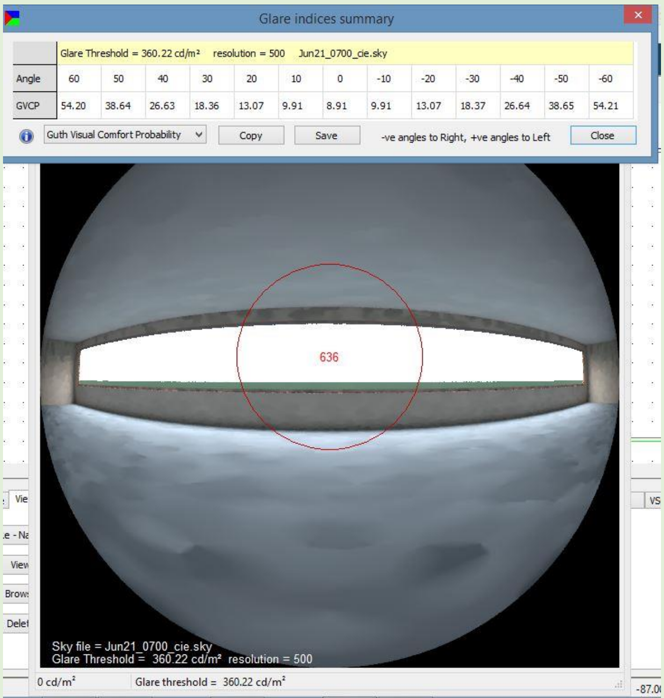
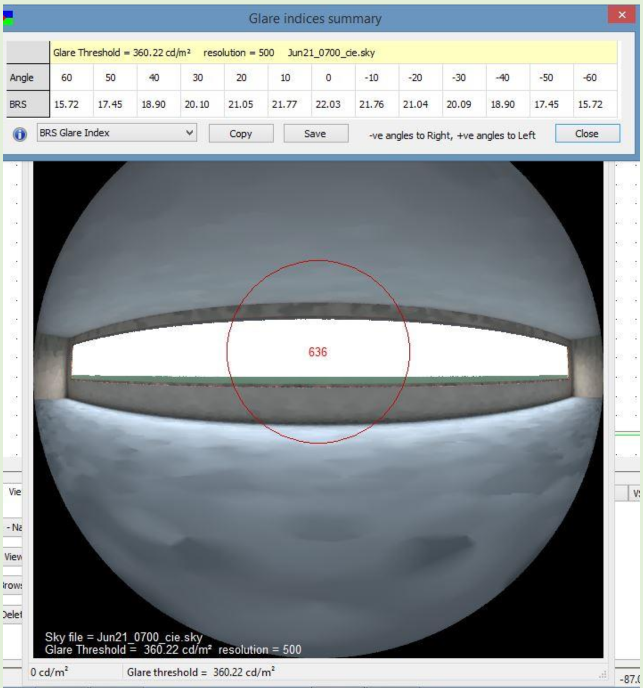


CGI



UGR

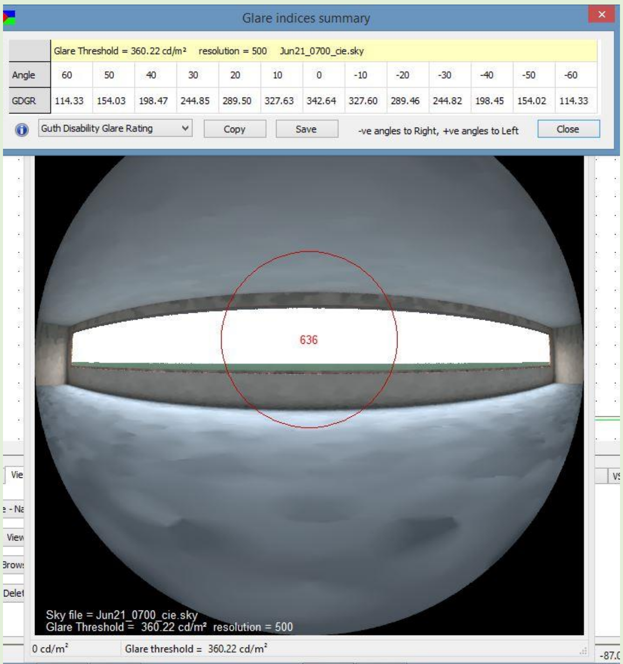


VCP	BRS
	

Glare indices summary
Glare Threshold = 360.22 cd/m² resolution = 500 Jun21_0700_cie.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 54.20 38.64 26.63 18.36 13.07 9.91 8.91 9.91 13.07 18.37 26.64 38.65 54.21
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
636
Sky file = Jun21_0700_cie.sky
Glare Threshold = 360.22 cd/m² resolution = 500
0 cd/m²
Glare threshold = 360.22 cd/m²

Glare indices summary
Glare Threshold = 360.22 cd/m² resolution = 500 Jun21_0700_cie.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 15.72 17.45 18.90 20.10 21.05 21.77 22.03 21.76 21.04 20.09 18.90 17.45 15.72
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
636
Sky file = Jun21_0700_cie.sky
Glare Threshold = 360.22 cd/m² resolution = 500
0 cd/m²
Glare threshold = 360.22 cd/m²

GDGR

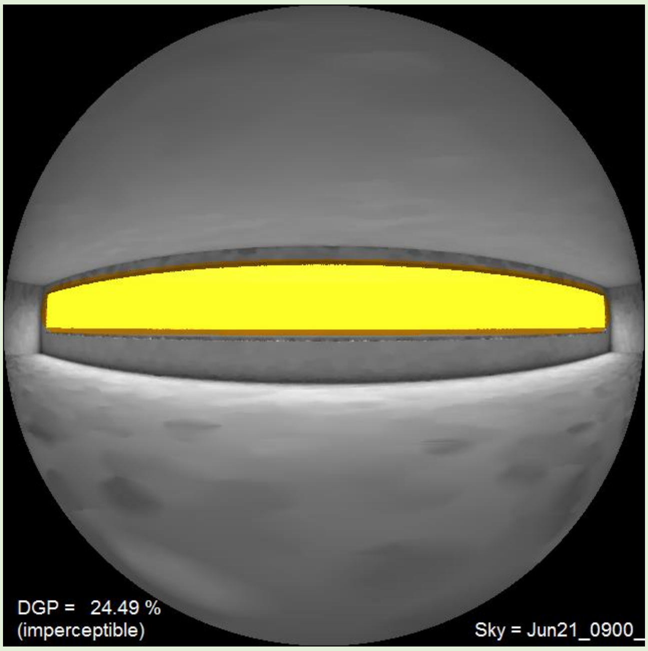


Glare indices summary
Glare Threshold = 360.22 cd/m² resolution = 500 Jun21_0700_cie.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 114.33 154.03 198.47 244.85 289.50 327.63 342.64 327.60 289.46 244.82 198.45 154.02 114.33
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
636
Sky file = Jun21_0700_cie.sky
Glare Threshold = 360.22 cd/m² resolution = 500
0 cd/m²
Glare threshold = 360.22 cd/m²

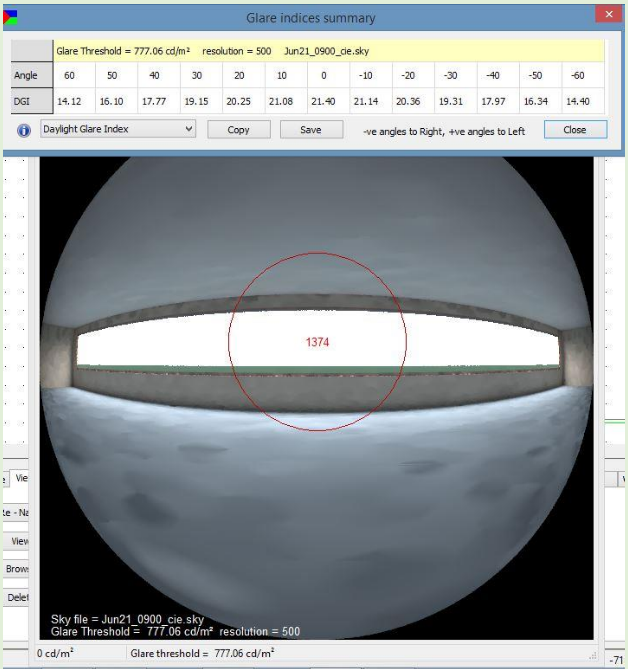
Table 144: Daylight and Glare Analysis for Jun 21, with overcast sky, (S), (P4),(T9).

Daylight and Glare Analysis for Jun 21, (overcast sky), (S), (P4) (T9).

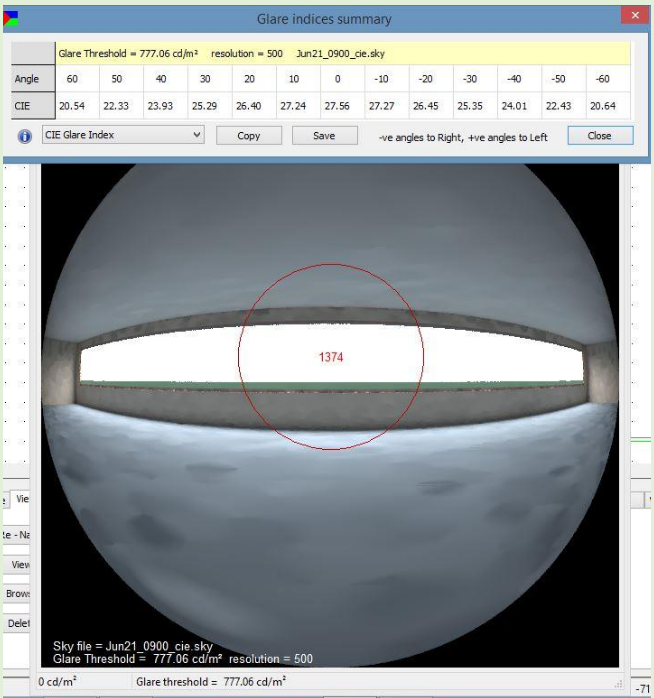
DGP



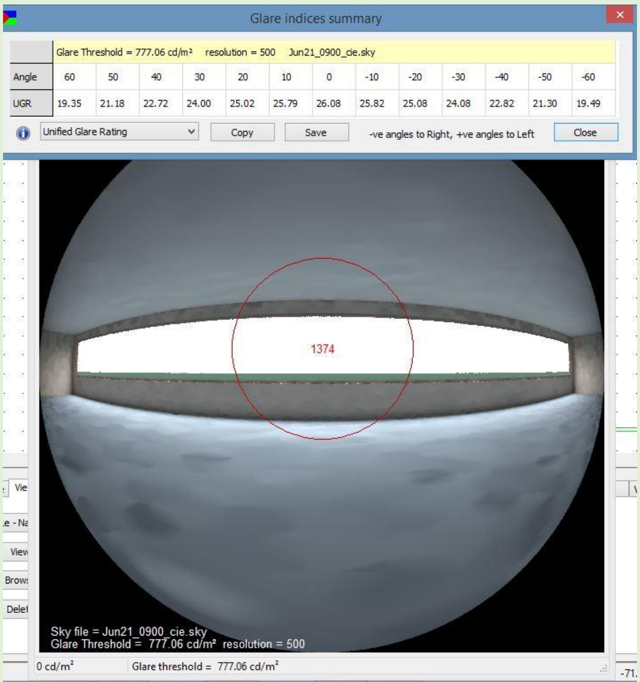
DGI

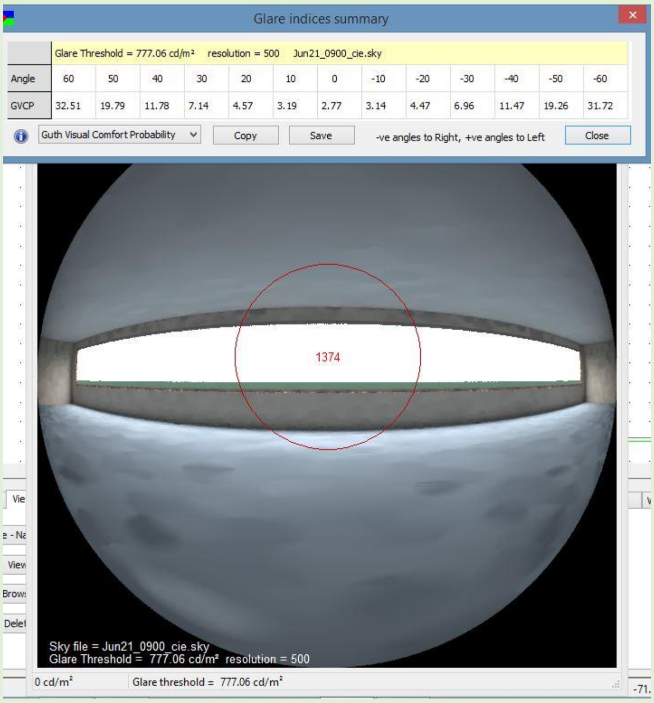
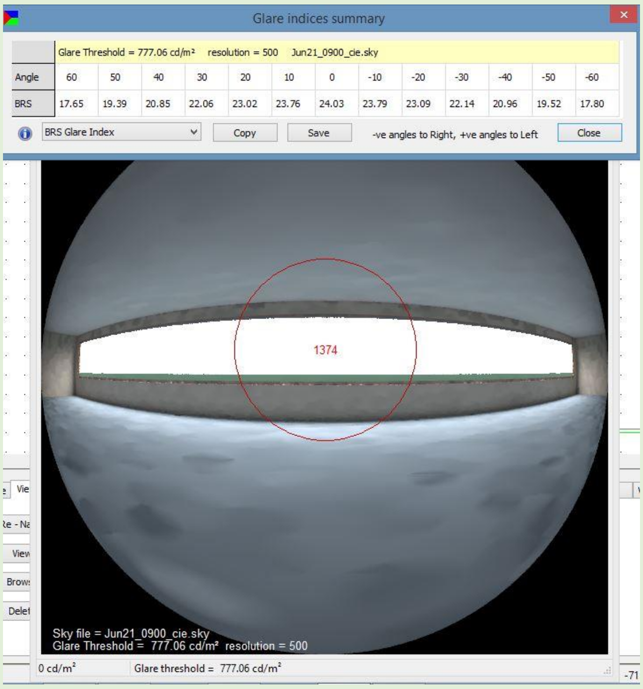


CGI



UGR

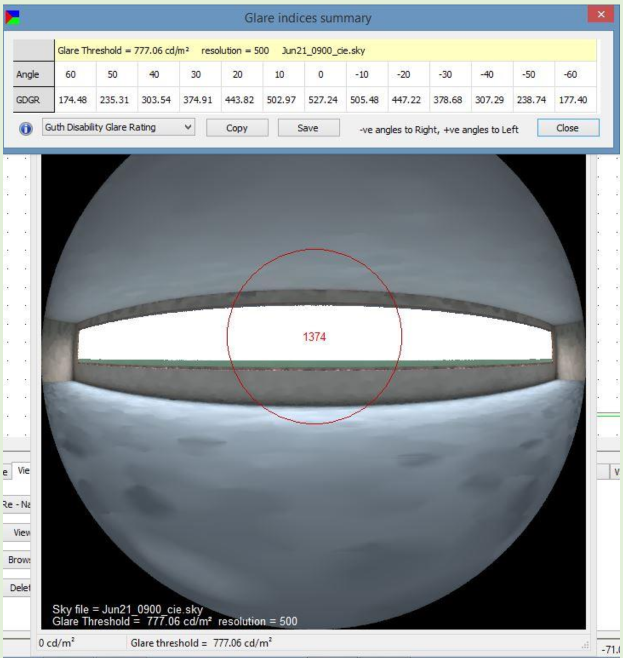


VCP	BRS
	

Glare indices summary
Glare Threshold = 777.06 cd/m² resolution = 500 Jun21_0900_cie.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 32.51 19.79 11.78 7.14 4.57 3.19 2.77 3.14 4.47 6.96 11.47 19.26 31.72
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1374
Sky file = Jun21_0900_cie.sky
Glare Threshold = 777.06 cd/m² resolution = 500
0 cd/m²
Glare threshold = 777.06 cd/m²

Glare indices summary
Glare Threshold = 777.06 cd/m² resolution = 500 Jun21_0900_cie.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 17.65 19.39 20.85 22.06 23.02 23.76 24.03 23.79 23.09 22.14 20.96 19.52 17.80
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1374
Sky file = Jun21_0900_cie.sky
Glare Threshold = 777.06 cd/m² resolution = 500
0 cd/m²
Glare threshold = 777.06 cd/m²

GDGR

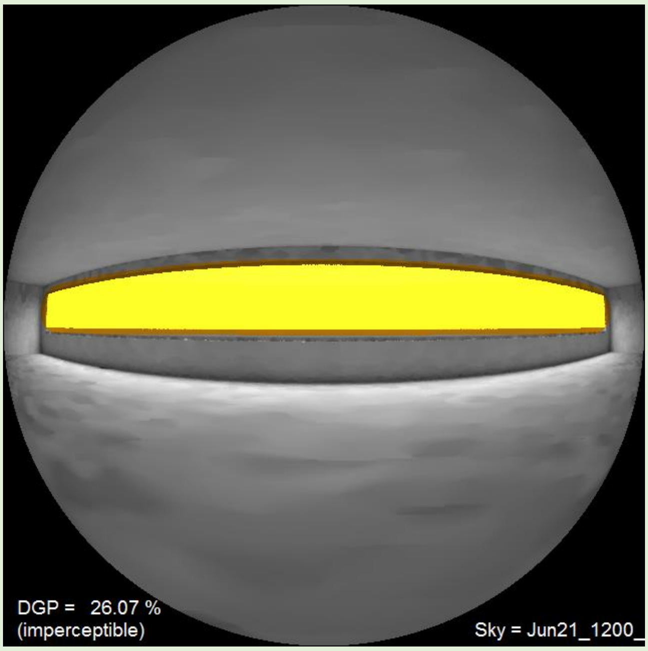


Glare indices summary
Glare Threshold = 777.06 cd/m² resolution = 500 Jun21_0900_cie.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 174.48 235.31 303.54 374.91 443.82 502.97 527.24 505.48 447.22 378.68 307.29 238.74 177.40
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1374
Sky file = Jun21_0900_cie.sky
Glare Threshold = 777.06 cd/m² resolution = 500
0 cd/m²
Glare threshold = 777.06 cd/m²

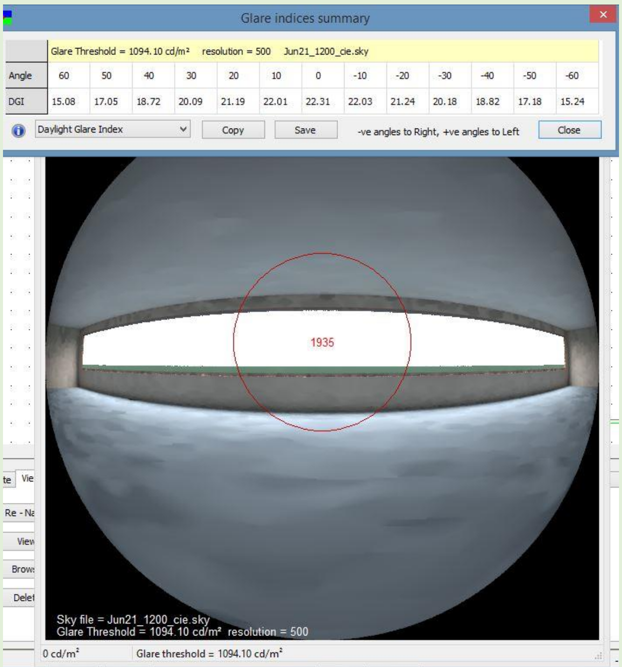
Table 145: Daylight and Glare Analysis for Jun 21, with overcast sky, (S), (P4),(T12).

Daylight and Glare Analysis for Jun 21, (overcast sky), (S), (P4) (T12).

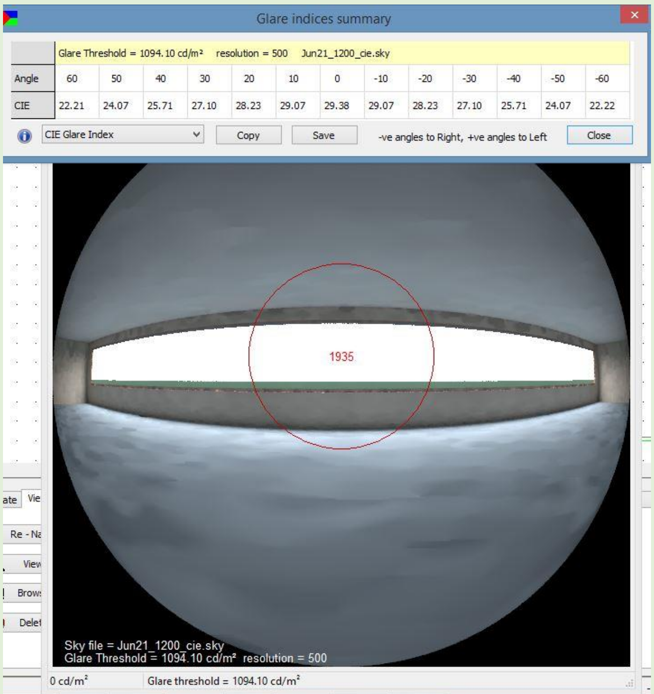
DGP



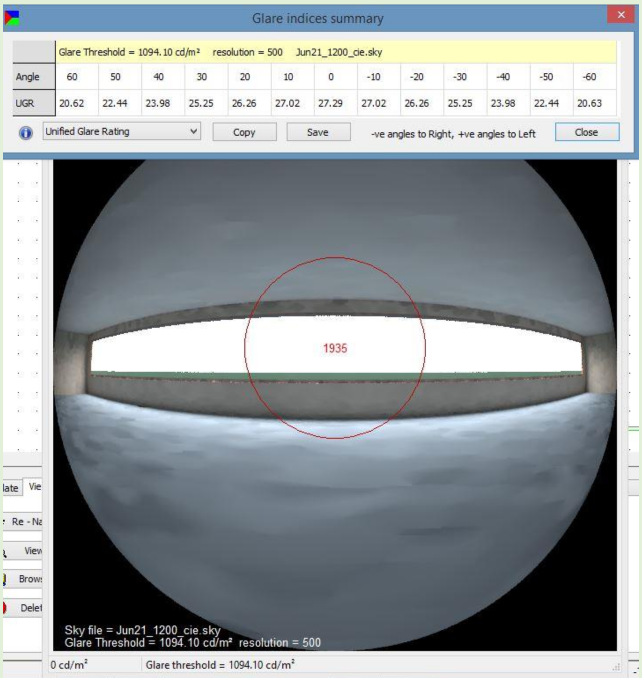
DGI



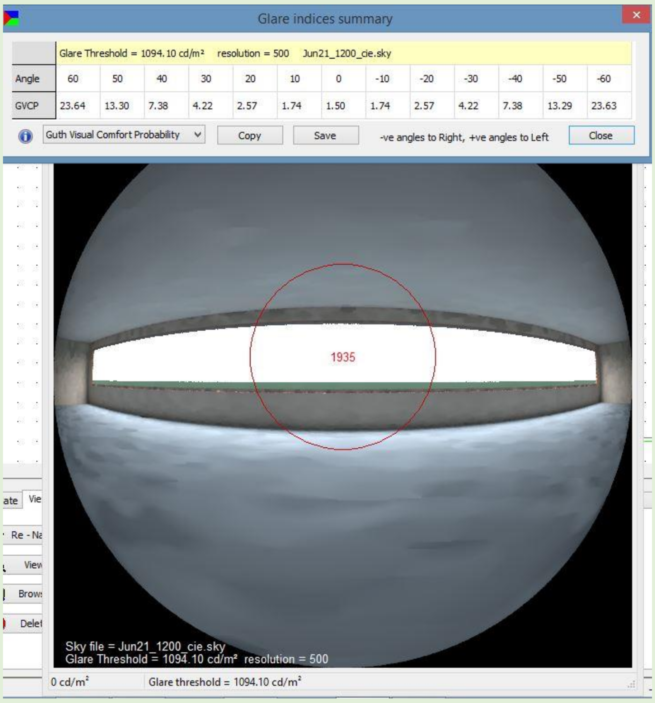
CGI



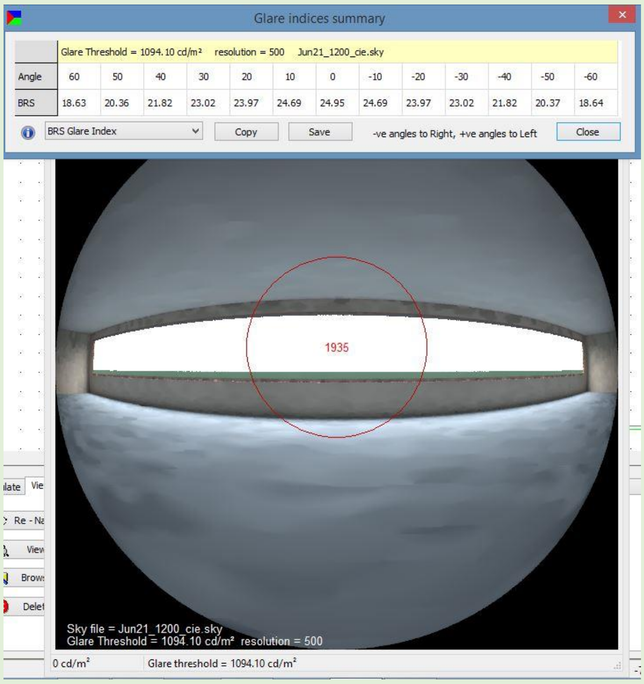
UGR



VCP


Glare indices summary
Glare Threshold = 1094.10 cd/m² resolution = 500 Jun21_1200_cie.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 23.64 13.30 7.38 4.22 2.57 1.74 1.50 1.74 2.57 4.22 7.38 13.29 23.63
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1935
Sky file = Jun21_1200_cie.sky
Glare Threshold = 1094.10 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1094.10 cd/m²

BRS


Glare indices summary
Glare Threshold = 1094.10 cd/m² resolution = 500 Jun21_1200_cie.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 18.63 20.36 21.82 23.02 23.97 24.69 24.95 24.69 23.97 23.02 21.82 20.37 18.64
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1935
Sky file = Jun21_1200_cie.sky
Glare Threshold = 1094.10 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1094.10 cd/m²

GDGR

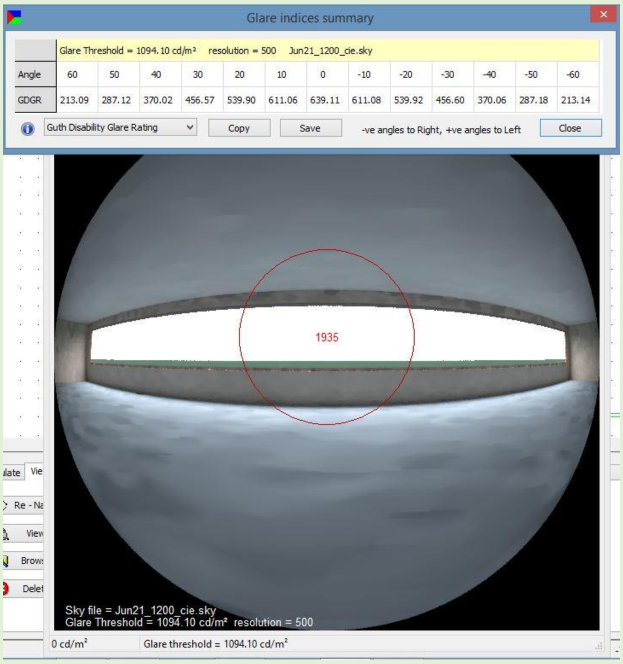
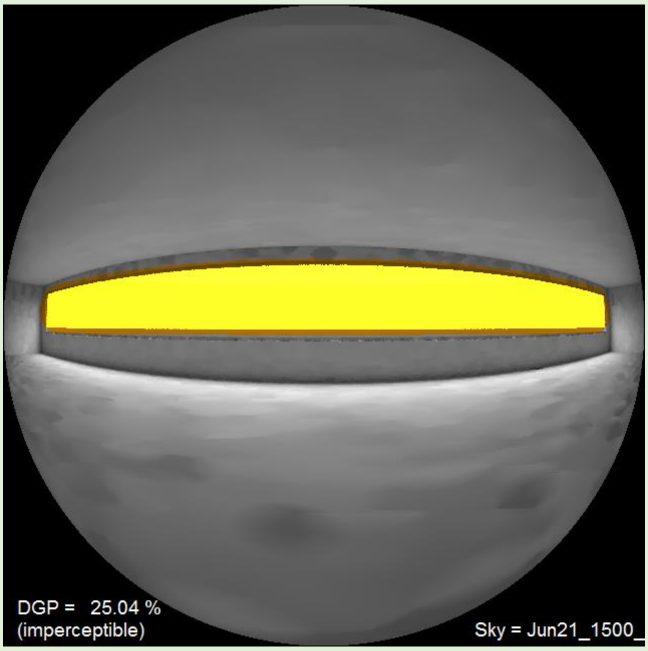

Glare indices summary
Glare Threshold = 1094.10 cd/m² resolution = 500 Jun21_1200_cie.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 213.09 287.12 370.02 456.57 539.90 611.06 639.11 611.08 539.92 456.60 370.06 287.18 213.14
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1935
Sky file = Jun21_1200_cie.sky
Glare Threshold = 1094.10 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1094.10 cd/m²

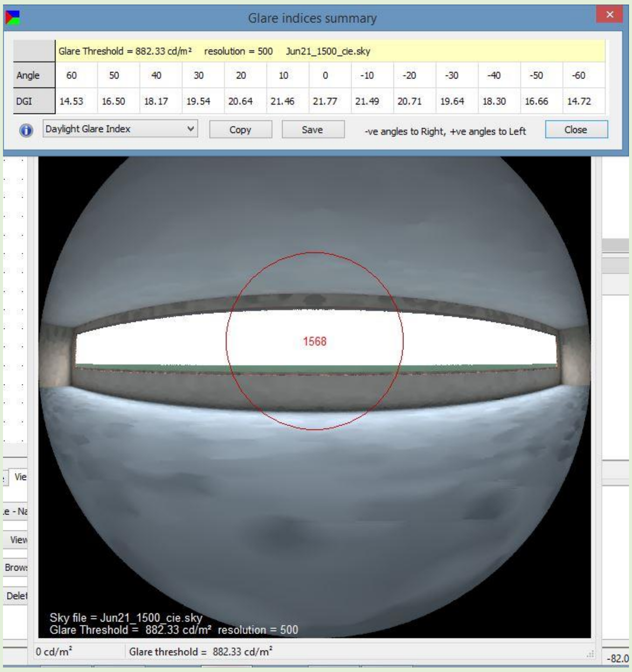
Table 146: Daylight and Glare Analysis for Jun 21, with overcast sky, (S), (P4),(T15).

Daylight and Glare Analysis for Jun 21, (overcast sky), (S), (P4) (T15).

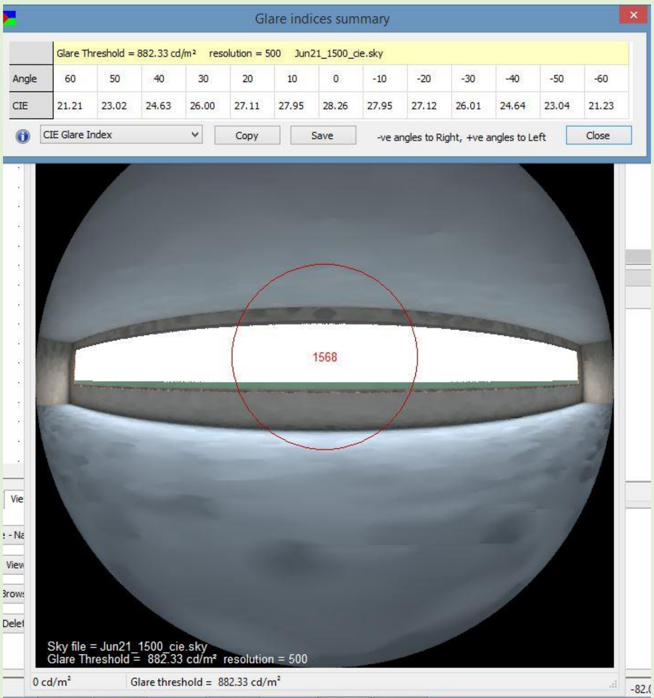
DGP



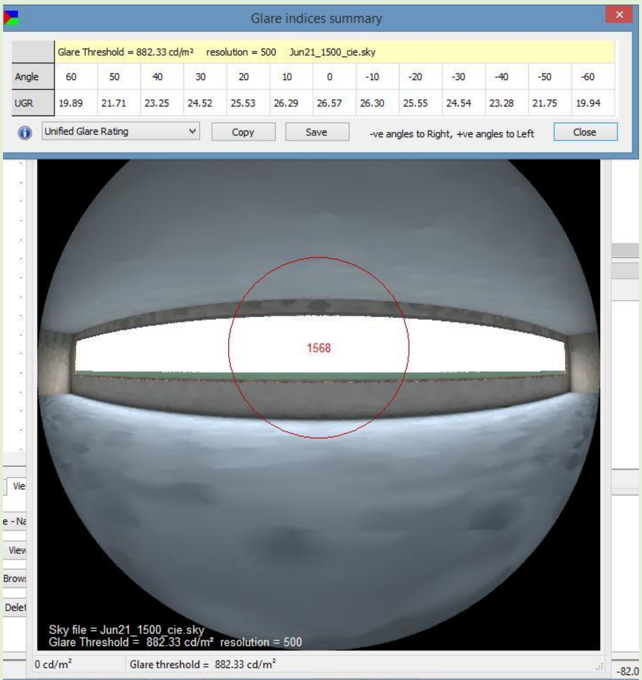
DGI

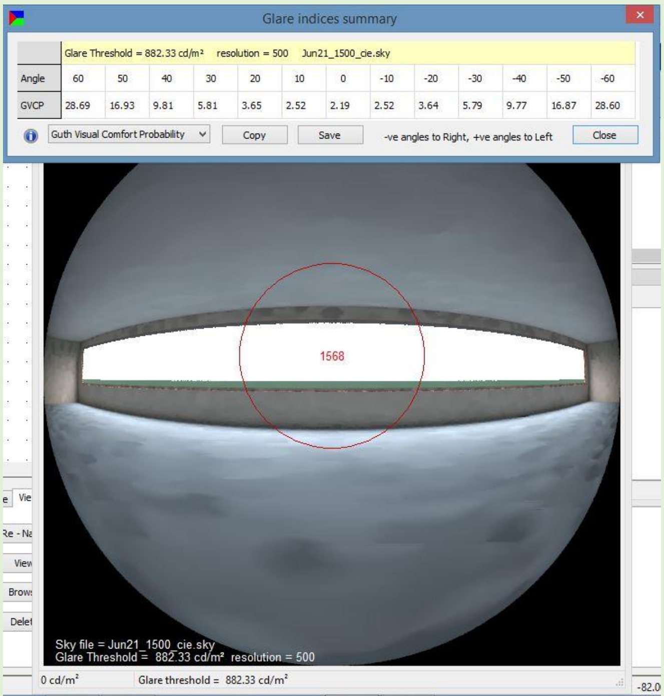
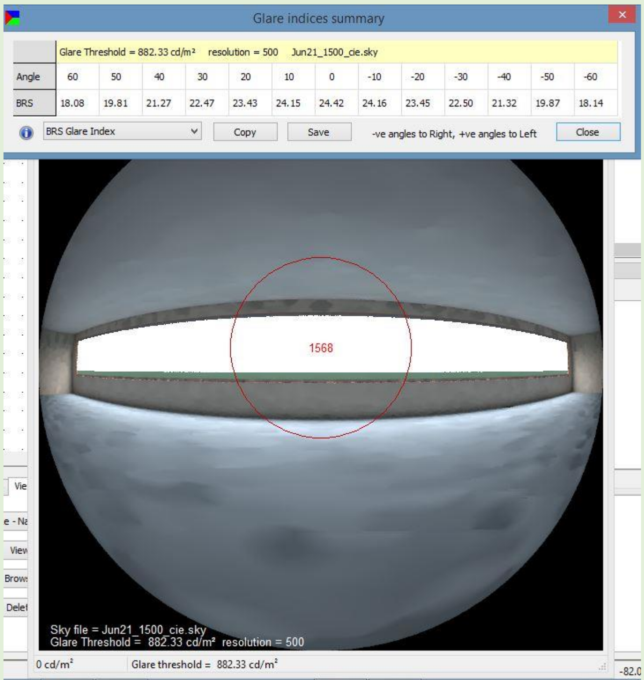


CGI



UGR

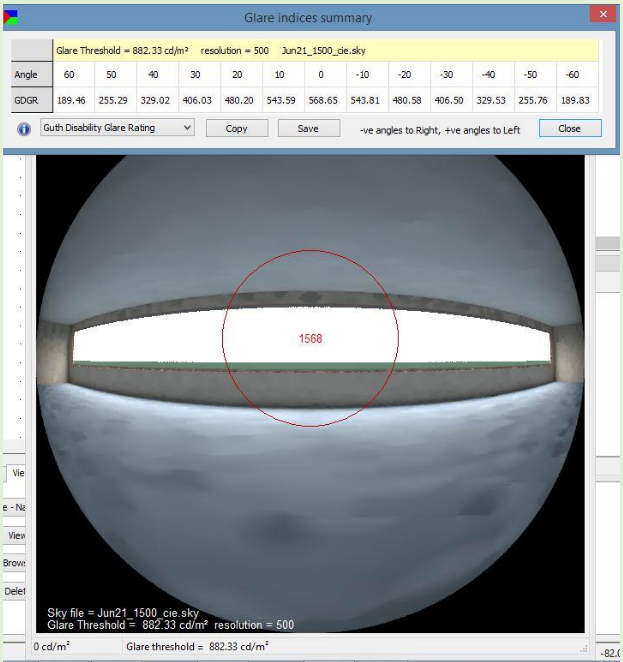


VCP	BRS
	

Glare indices summary
Glare Threshold = 882.33 cd/m² resolution = 500 Jun21_1500_cie.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 28.69 16.93 9.81 5.81 3.65 2.52 2.19 2.52 3.64 5.79 9.77 16.87 28.60
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1568
Sky file = Jun21_1500_cie.sky
Glare Threshold = 882.33 cd/m² resolution = 500
0 cd/m²
Glare threshold = 882.33 cd/m²

Glare indices summary
Glare Threshold = 882.33 cd/m² resolution = 500 Jun21_1500_cie.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 18.08 19.81 21.27 22.47 23.43 24.15 24.42 24.16 23.45 22.50 21.32 19.87 18.14
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1568
Sky file = Jun21_1500_cie.sky
Glare Threshold = 882.33 cd/m² resolution = 500
0 cd/m²
Glare threshold = 882.33 cd/m²

GDGR

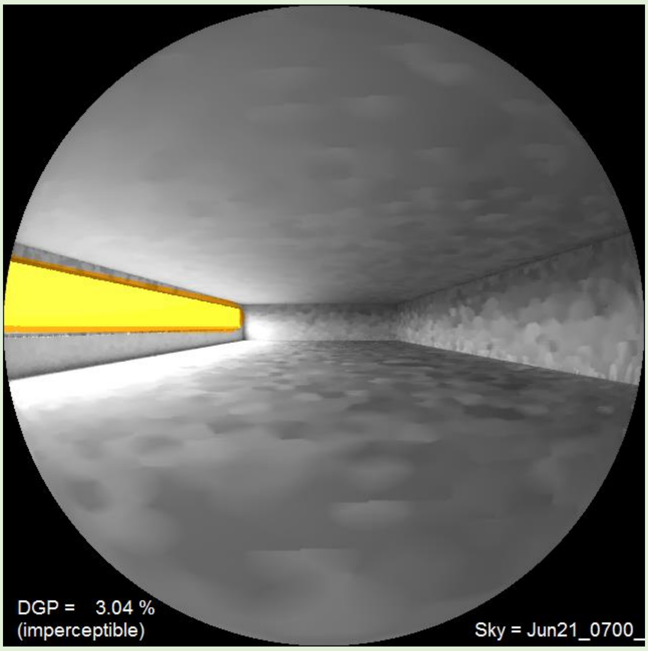


Glare indices summary
Glare Threshold = 882.33 cd/m² resolution = 500 Jun21_1500_cie.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 189.46 255.29 329.02 406.03 480.20 543.59 568.65 543.81 480.58 406.50 329.53 255.76 189.83
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1568
Sky file = Jun21_1500_cie.sky
Glare Threshold = 882.33 cd/m² resolution = 500
0 cd/m²
Glare threshold = 882.33 cd/m²

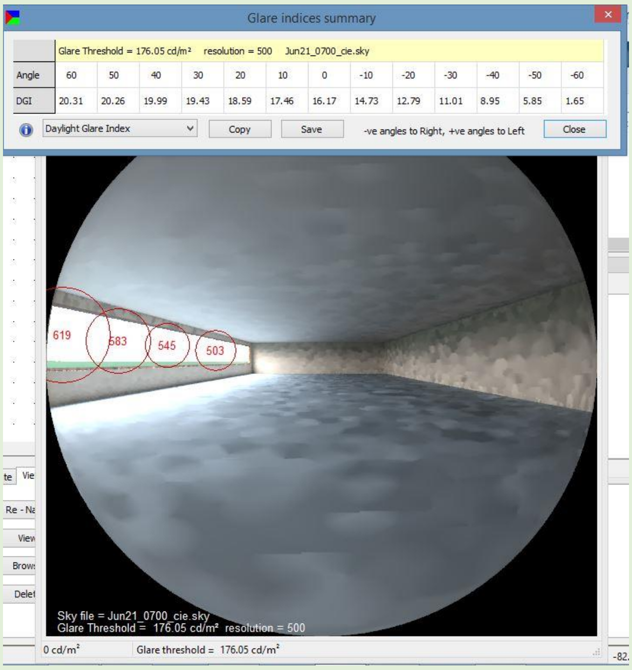
Table 147: Daylight and Glare Analysis for Jun 21, with overcast sky, (S), (P5),(T7).

Daylight and Glare Analysis for Jun 21, (overcast sky), (S), (P5) (T7).

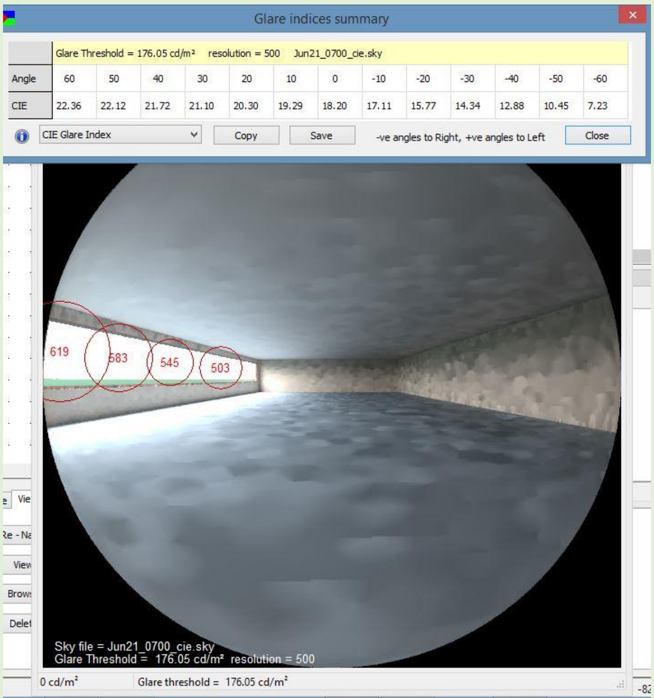
DGP



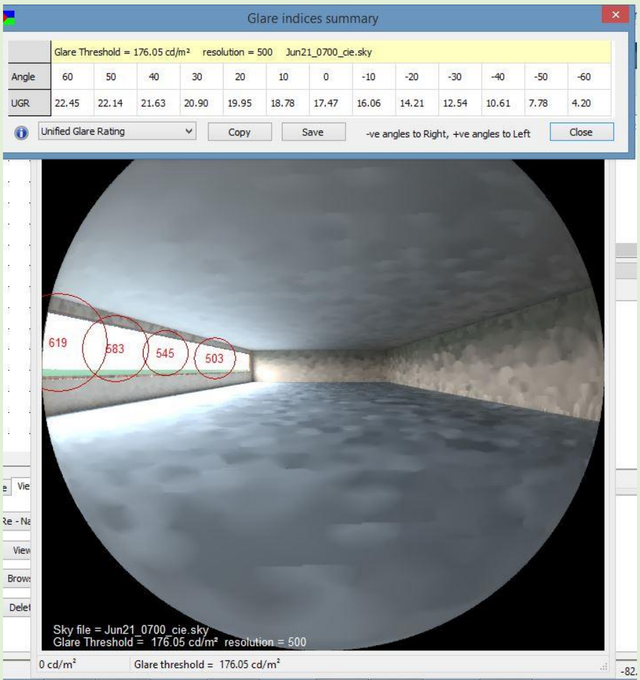
DGI



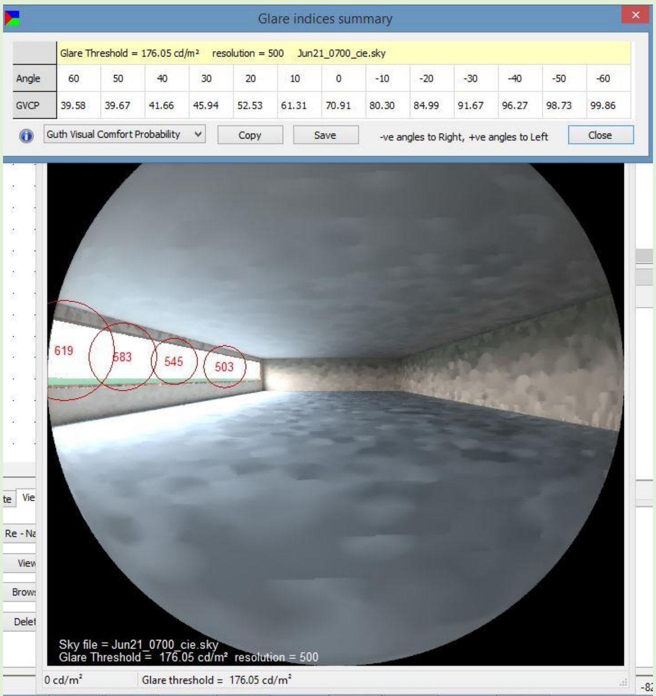
CGI



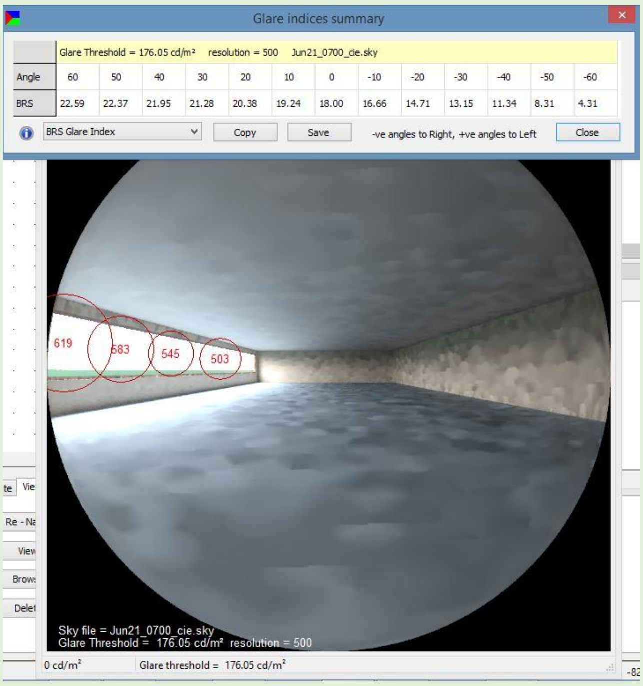
UGR



VCP


Glare indices summary
Glare Threshold = 176.05 cd/m² resolution = 500 Jun21_0700_cie.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 39.58 39.67 41.66 45.94 52.53 61.31 70.91 80.30 84.99 91.67 96.27 98.73 99.86
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
619
583
545
503
Sky file = Jun21_0700_cie.sky
Glare Threshold = 176.05 cd/m² resolution = 500
0 cd/m²
Glare threshold = 176.05 cd/m²

BRS


Glare indices summary
Glare Threshold = 176.05 cd/m² resolution = 500 Jun21_0700_cie.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 22.59 22.37 21.95 21.28 20.38 19.24 18.00 16.66 14.71 13.15 11.34 8.31 4.31
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
619
583
545
503
Sky file = Jun21_0700_cie.sky
Glare Threshold = 176.05 cd/m² resolution = 500
0 cd/m²
Glare threshold = 176.05 cd/m²

GDGR

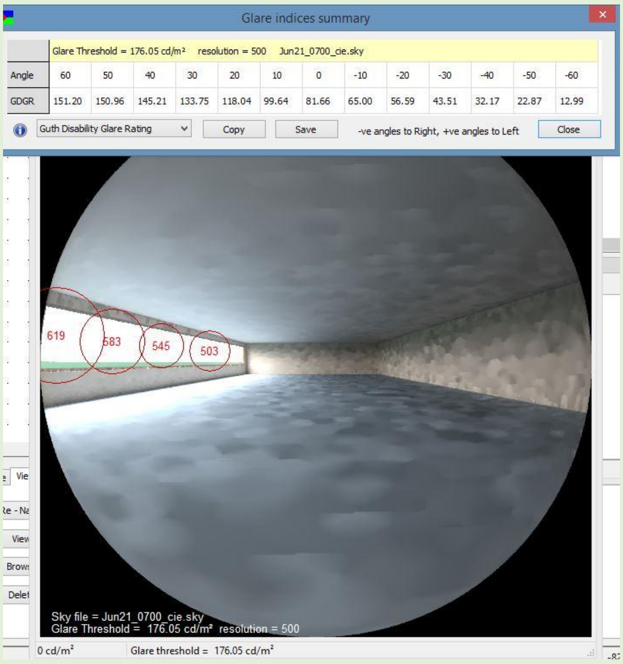
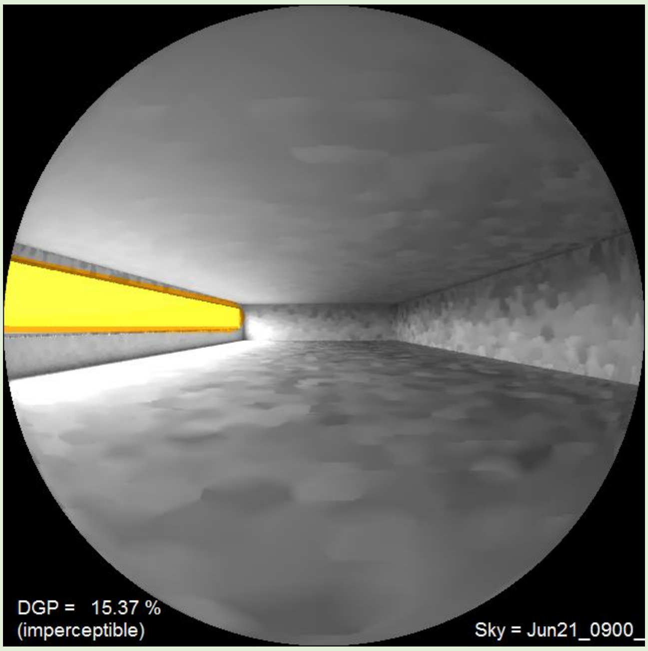

Glare indices summary
Glare Threshold = 176.05 cd/m² resolution = 500 Jun21_0700_cie.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 151.20 150.96 145.21 133.75 118.04 99.64 81.66 65.00 56.59 43.51 32.17 22.87 12.99
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
619
583
545
503
Sky file = Jun21_0700_cie.sky
Glare Threshold = 176.05 cd/m² resolution = 500
0 cd/m²
Glare threshold = 176.05 cd/m²

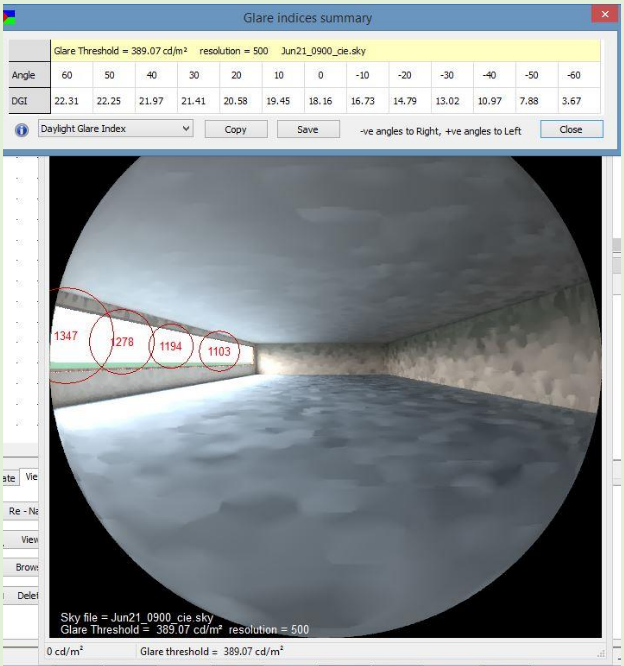
Table 148: Daylight and Glare Analysis for Jun 21, with overcast sky, (S), (P5),(T9).

Daylight and Glare Analysis for Jun 21, (overcast sky), (S), (P5) (T9).

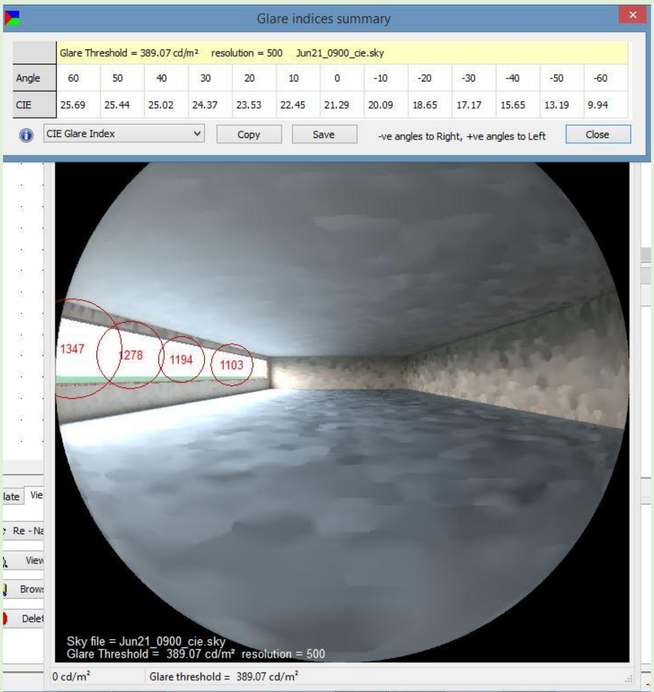
DGP



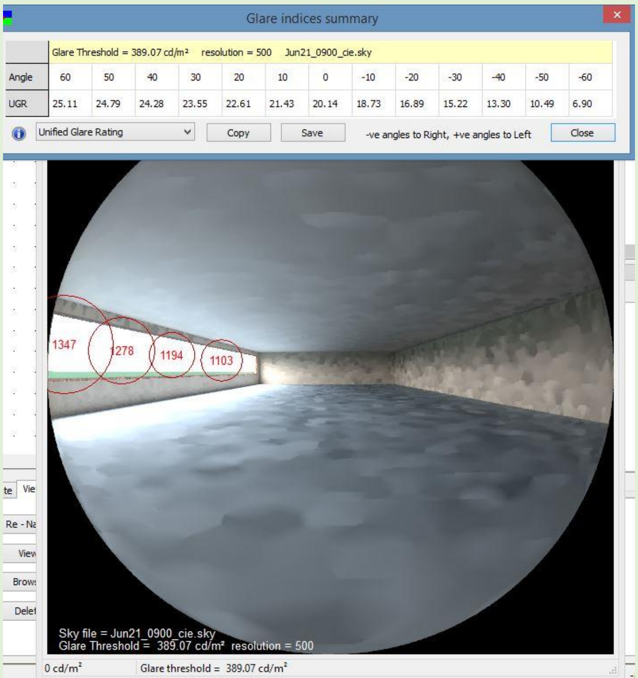
DGI



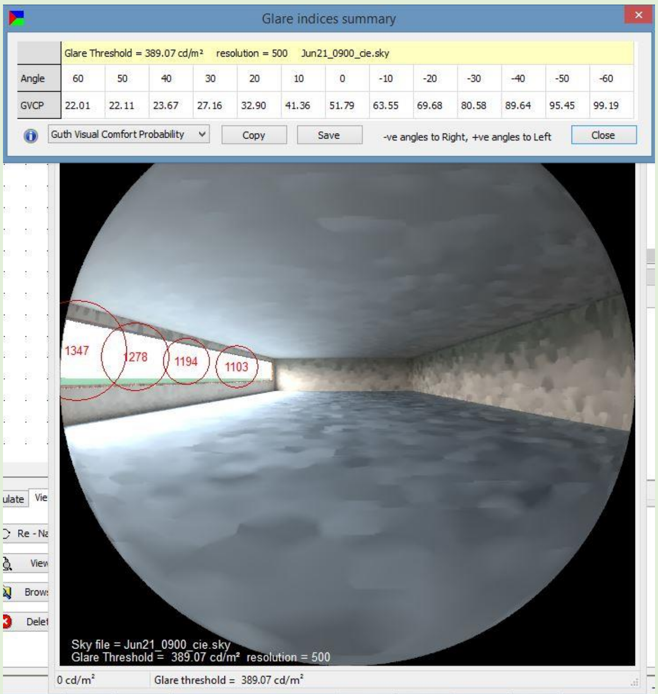
CGI



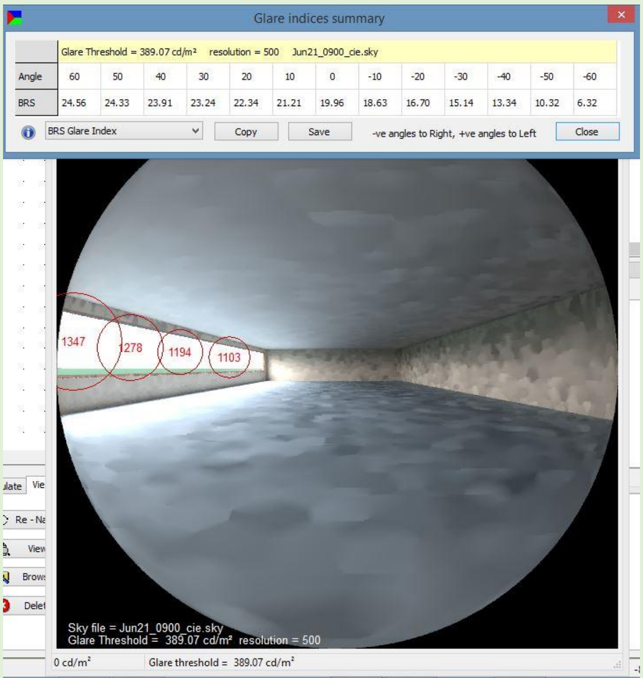
UGR



VCP


Glare indices summary
Glare Threshold = 389.07 cd/m² resolution = 500 Jun21_0900_cie.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 22.01 22.11 23.67 27.16 32.90 41.36 51.79 63.55 69.68 80.58 89.64 95.45 99.19
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1347
1278
1194
1103
Sky file = Jun21_0900_cie.sky
Glare Threshold = 389.07 cd/m² resolution = 500
0 cd/m²
Glare threshold = 389.07 cd/m²

BRS


Glare indices summary
Glare Threshold = 389.07 cd/m² resolution = 500 Jun21_0900_cie.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 24.56 24.33 23.91 23.24 22.34 21.21 19.96 18.63 16.70 15.14 13.34 10.32 6.32
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1347
1278
1194
1103
Sky file = Jun21_0900_cie.sky
Glare Threshold = 389.07 cd/m² resolution = 500
0 cd/m²
Glare threshold = 389.07 cd/m²

GDGR

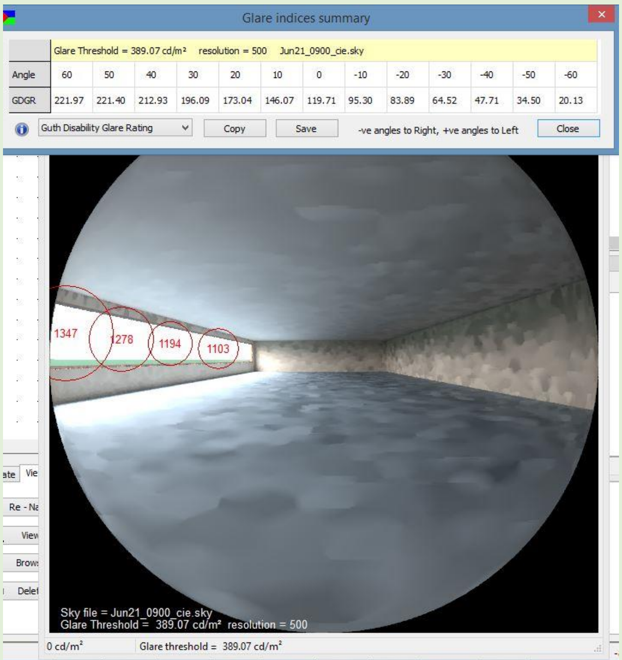
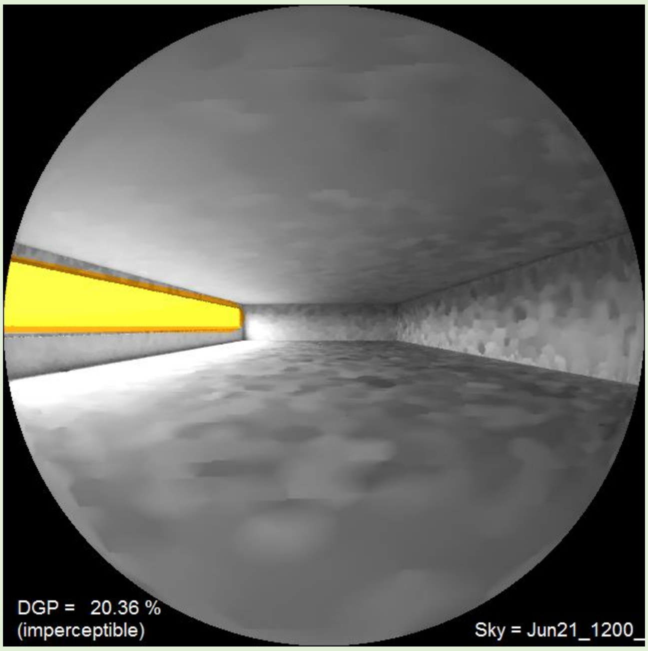

Glare indices summary
Glare Threshold = 389.07 cd/m² resolution = 500 Jun21_0900_cie.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 221.97 221.40 212.93 196.09 173.04 146.07 119.71 95.30 83.89 64.52 47.71 34.50 20.13
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1347
1278
1194
1103
Sky file = Jun21_0900_cie.sky
Glare Threshold = 389.07 cd/m² resolution = 500
0 cd/m²
Glare threshold = 389.07 cd/m²

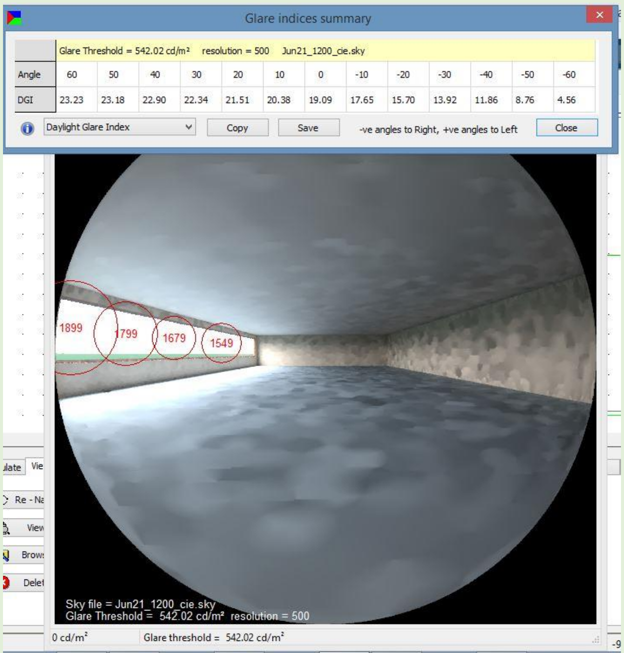
Table 149: Daylight and Glare Analysis for Jun 21, with overcast sky, (S), (P5),(T12).

Daylight and Glare Analysis for Jun 21, (overcast sky), (S), (P5) (T12).

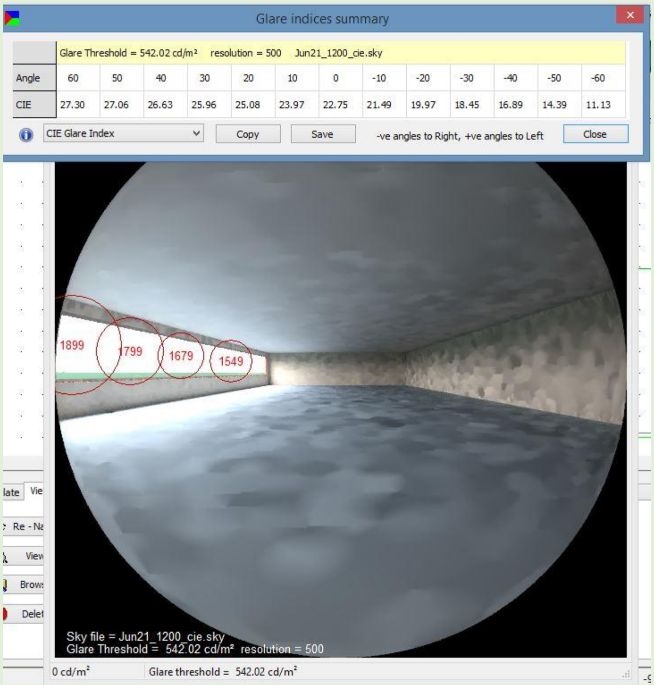
DGP



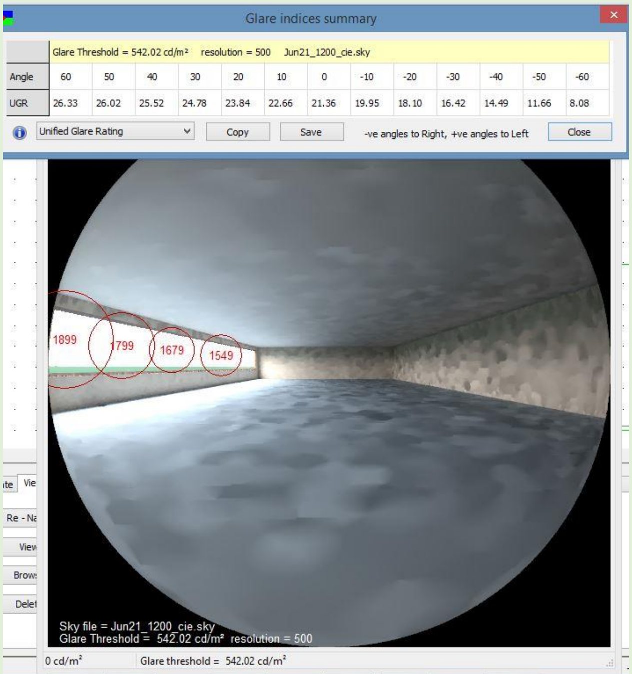
DGI



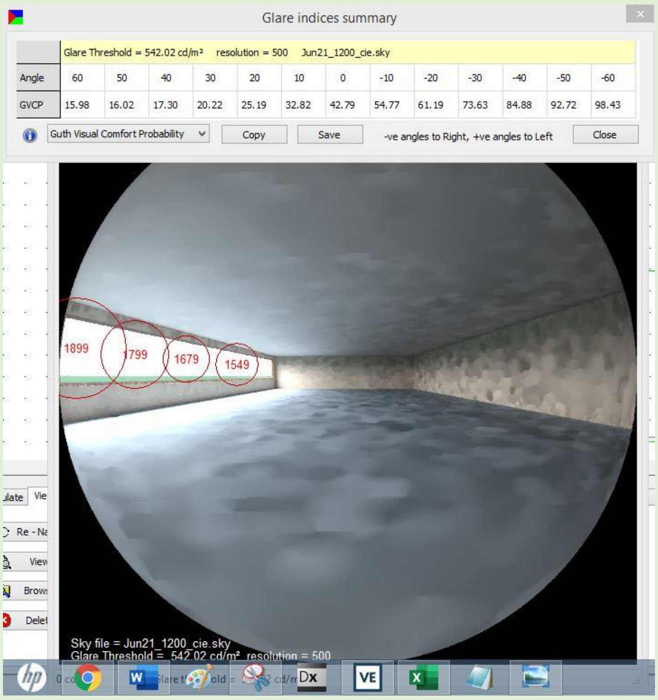
CGI



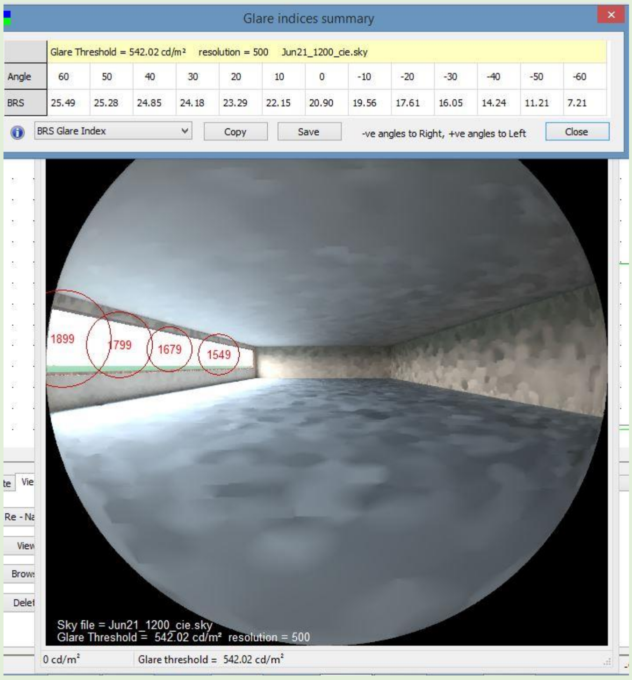
UGR



VCP


Glare indices summary
Glare Threshold = 542.02 cd/m² resolution = 500 Jun21_1200_cie.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 15.98 16.02 17.30 20.22 25.19 32.82 42.79 54.77 61.19 73.63 84.88 92.72 98.43
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1899
1799
1679
1549
Sky file = Jun21_1200_cie.sky
Glare Threshold = 542.02 cd/m² resolution = 500

BRS


Glare indices summary
Glare Threshold = 542.02 cd/m² resolution = 500 Jun21_1200_cie.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 25.49 25.28 24.85 24.18 23.29 22.15 20.90 19.56 17.61 16.05 14.24 11.21 7.21
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1899
1799
1679
1549
Sky file = Jun21_1200_cie.sky
Glare Threshold = 542.02 cd/m² resolution = 500
0 cd/m²
Glare threshold = 542.02 cd/m²

GDGR

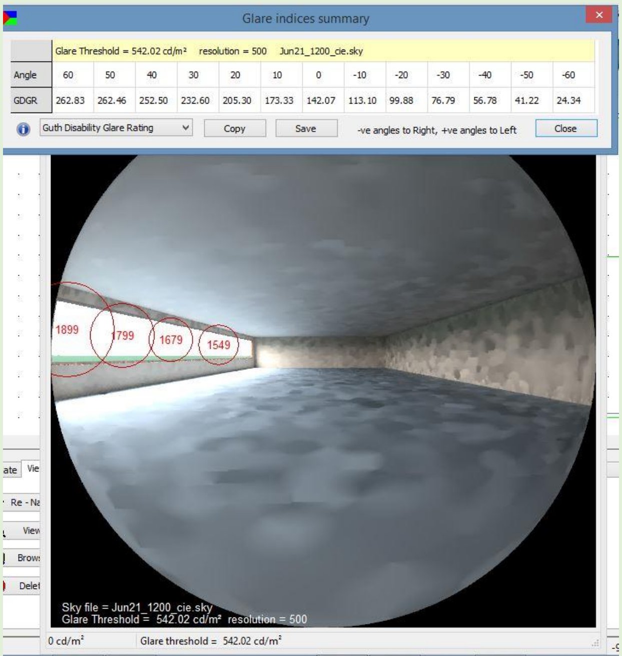
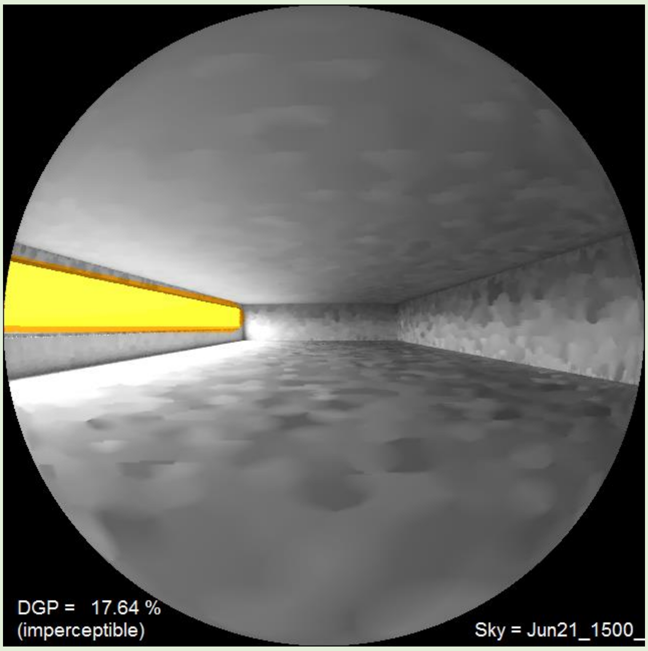

Glare indices summary
Glare Threshold = 542.02 cd/m² resolution = 500 Jun21_1200_cie.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 262.83 262.46 252.50 232.60 205.30 173.33 142.07 113.10 99.88 76.79 56.78 41.22 24.34
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1899
1799
1679
1549
Sky file = Jun21_1200_cie.sky
Glare Threshold = 542.02 cd/m² resolution = 500
0 cd/m²
Glare threshold = 542.02 cd/m²

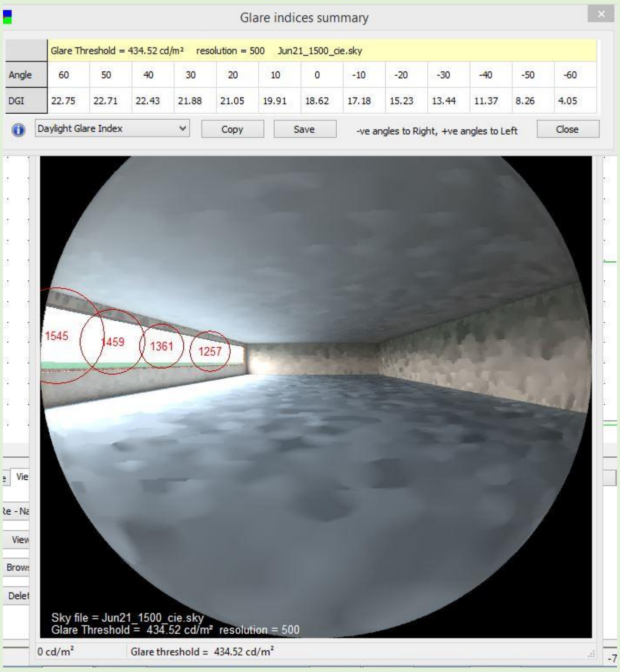
Table 150: Daylight and Glare Analysis for Jun 21, with overcast sky, (S), (P5),(T15).

Daylight and Glare Analysis for Jun 21, (overcast sky), (S), (P5) (T15).

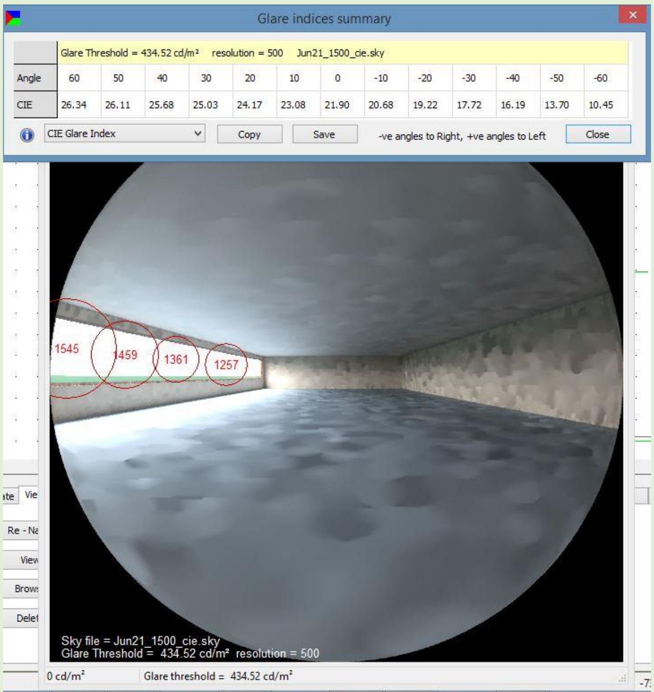
DGP



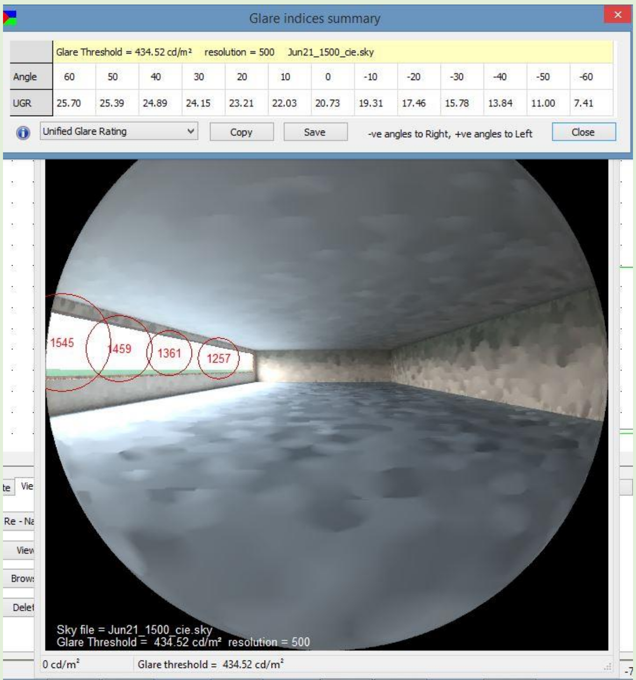
DGI



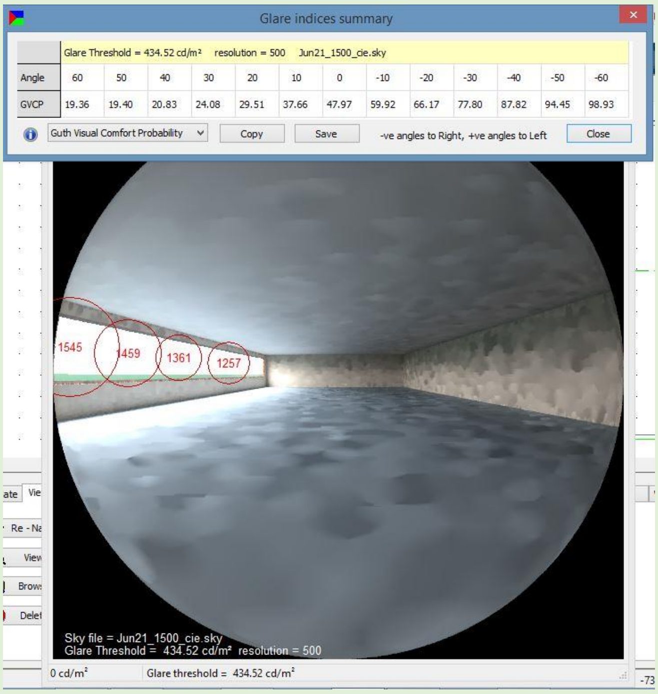
CGI



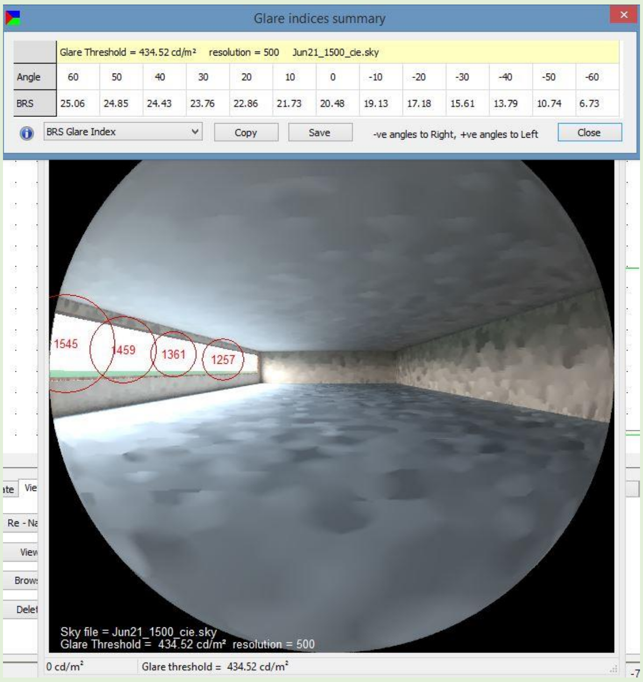
UGR



VCP


Glare indices summary
Glare Threshold = 434.52 cd/m² resolution = 500 Jun21_1500_cie.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 19.36 19.40 20.83 24.08 29.51 37.66 47.97 59.92 66.17 77.80 87.82 94.45 98.93
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1545
1459
1361
1257
Sky file = Jun21_1500_cie.sky
Glare Threshold = 434.52 cd/m² resolution = 500
0 cd/m²
Glare threshold = 434.52 cd/m²

BRS


Glare indices summary
Glare Threshold = 434.52 cd/m² resolution = 500 Jun21_1500_cie.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 25.06 24.85 24.43 23.76 22.86 21.73 20.48 19.13 17.18 15.61 13.79 10.74 6.73
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1545
1459
1361
1257
Sky file = Jun21_1500_cie.sky
Glare Threshold = 434.52 cd/m² resolution = 500
0 cd/m²
Glare threshold = 434.52 cd/m²

GDGR

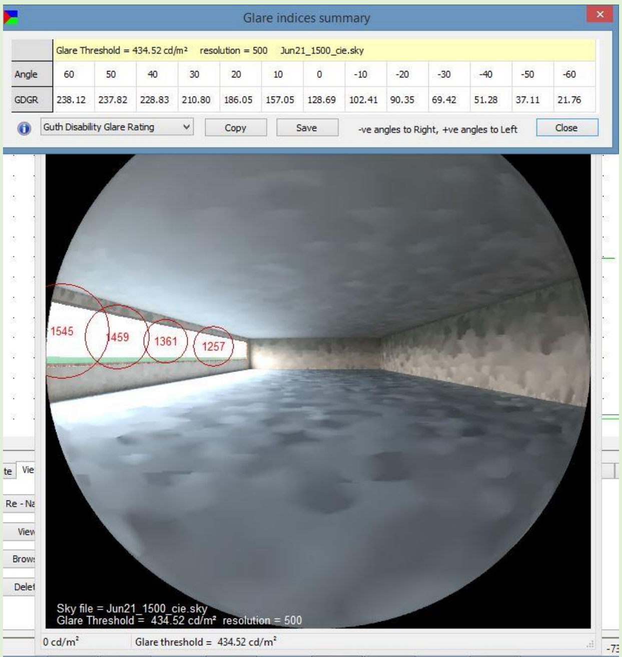
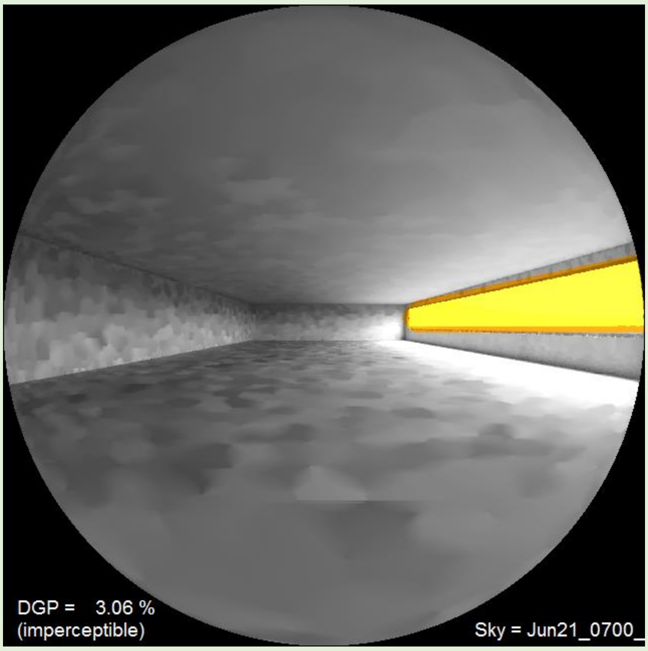

Glare indices summary
Glare Threshold = 434.52 cd/m² resolution = 500 Jun21_1500_cie.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 238.12 237.82 228.83 210.80 186.05 157.05 128.69 102.41 90.35 69.42 51.28 37.11 21.76
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1545
1459
1361
1257
Sky file = Jun21_1500_cie.sky
Glare Threshold = 434.52 cd/m² resolution = 500
0 cd/m²
Glare threshold = 434.52 cd/m²

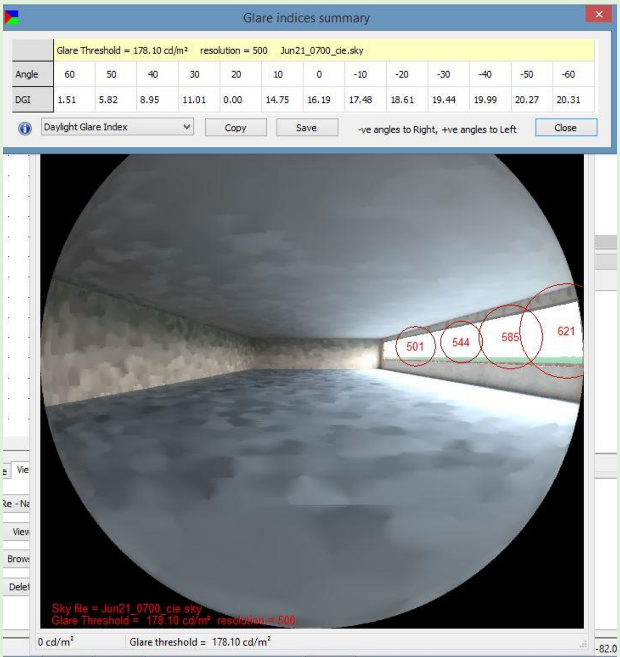
Table 151: Daylight and Glare Analysis for Jun 21, with overcast sky, (S), (P6),(T7).

Daylight and Glare Analysis for Jun 21, (overcast sky), (S), (P6) (T7).

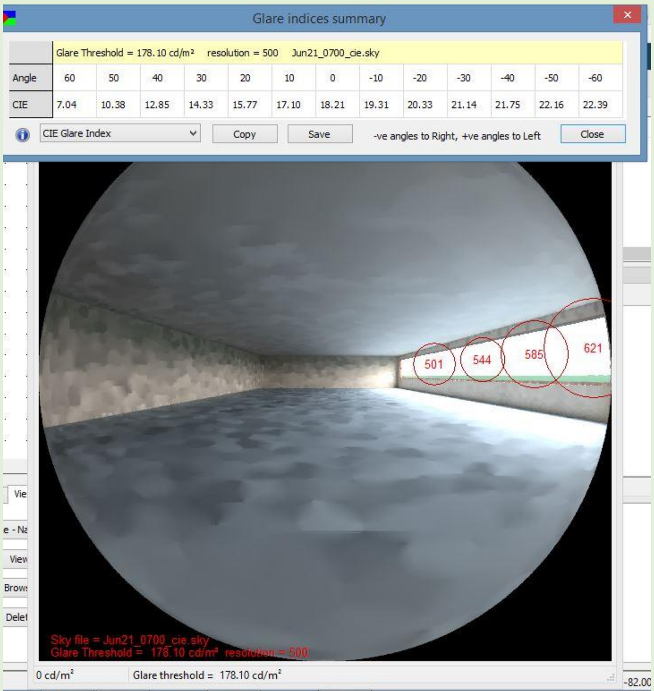
DGP



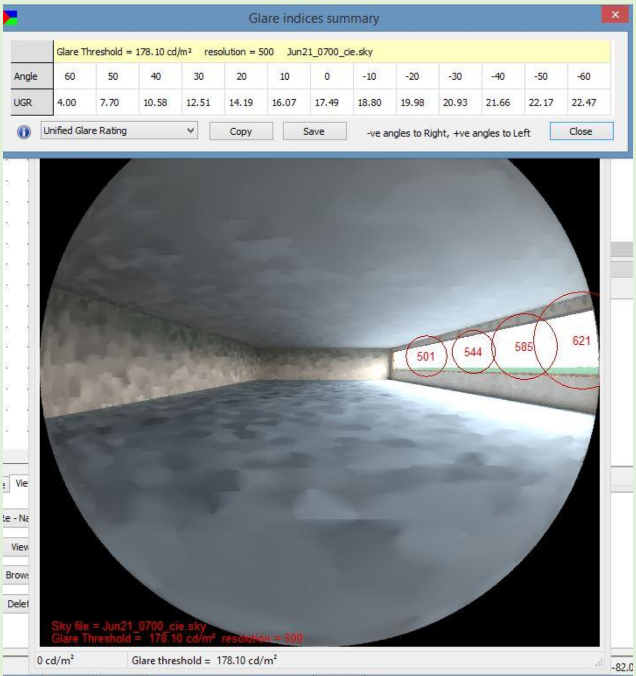
DGI

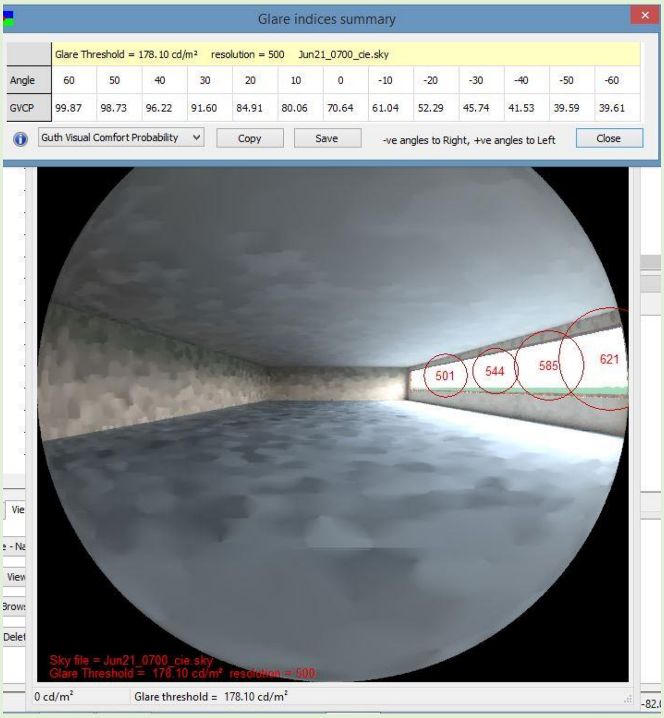
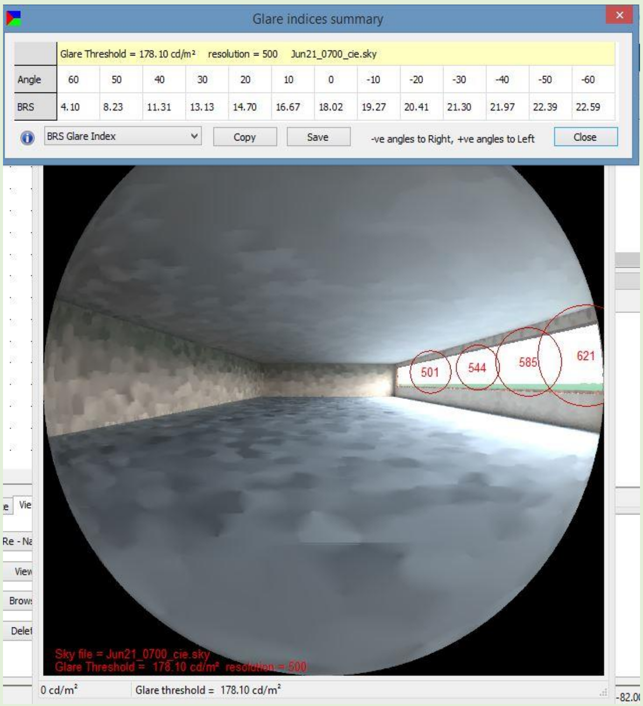


CGI



UGR

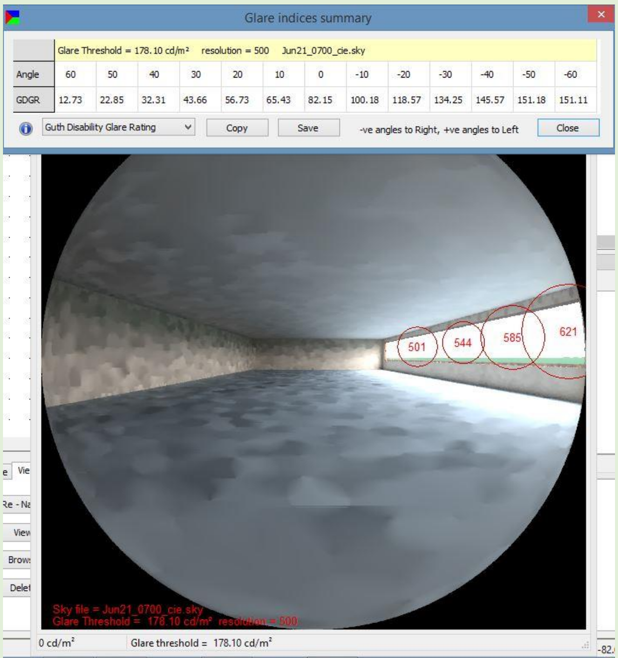


VCP	BRS
	

Glare indices summary
Glare Threshold = 178.10 cd/m² resolution = 500 Jun21_0700_cie.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 99.87 98.73 96.22 91.60 84.91 80.06 70.64 61.04 52.29 45.74 41.53 39.59 39.61
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
501
544
585
621
Sky file = Jun21_0700_cie.sky
Glare Threshold = 178.10 cd/m² resolution = 500
0 cd/m²
Glare threshold = 178.10 cd/m²

Glare indices summary
Glare Threshold = 178.10 cd/m² resolution = 500 Jun21_0700_cie.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 4.10 8.23 11.31 13.13 14.70 16.67 18.02 19.27 20.41 21.30 21.97 22.39 22.59
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
501
544
585
621
Sky file = Jun21_0700_cie.sky
Glare Threshold = 178.10 cd/m² resolution = 500
0 cd/m²
Glare threshold = 178.10 cd/m²

GDGR

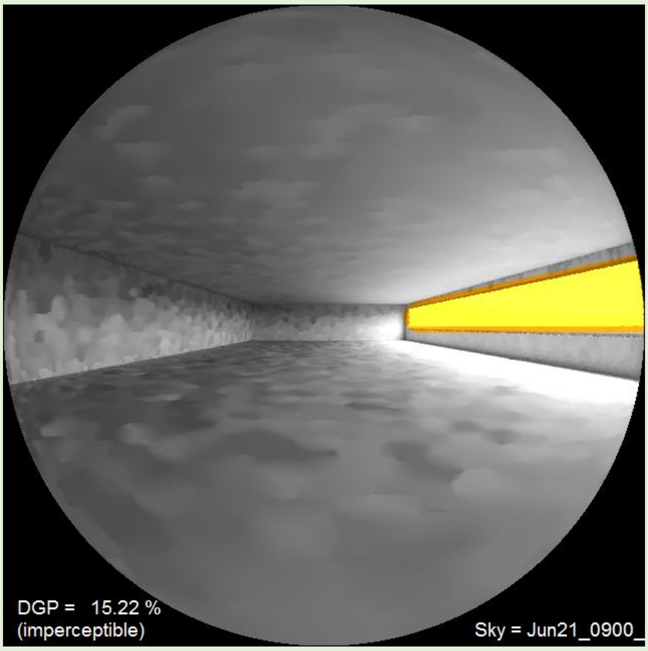


Glare indices summary
Glare Threshold = 178.10 cd/m² resolution = 500 Jun21_0700_cie.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 12.73 22.85 32.31 43.66 56.73 65.43 82.15 100.18 118.57 134.25 145.57 151.18 151.11
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
501
544
585
621
Sky file = Jun21_0700_cie.sky
Glare Threshold = 178.10 cd/m² resolution = 500
0 cd/m²
Glare threshold = 178.10 cd/m²

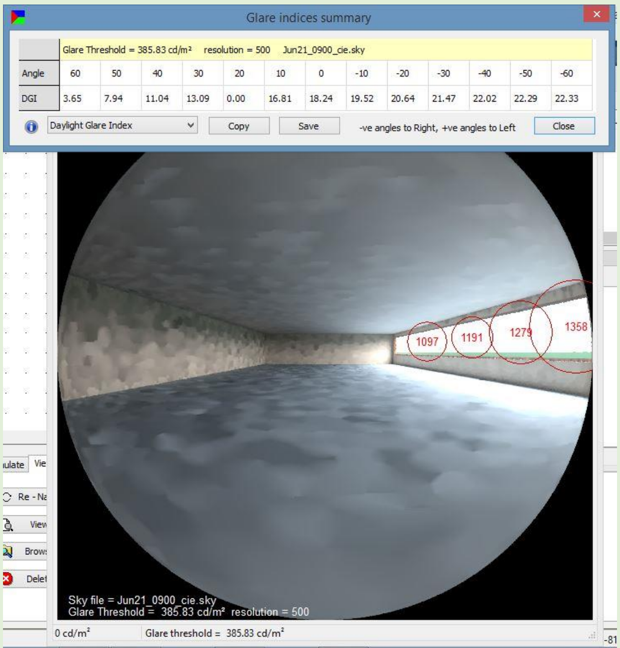
Table 152: Daylight and Glare Analysis for Jun 21, with overcast sky, (S), (P6),(T9).

Daylight and Glare Analysis for Jun 21, (overcast sky), (S), (P6) (T9).

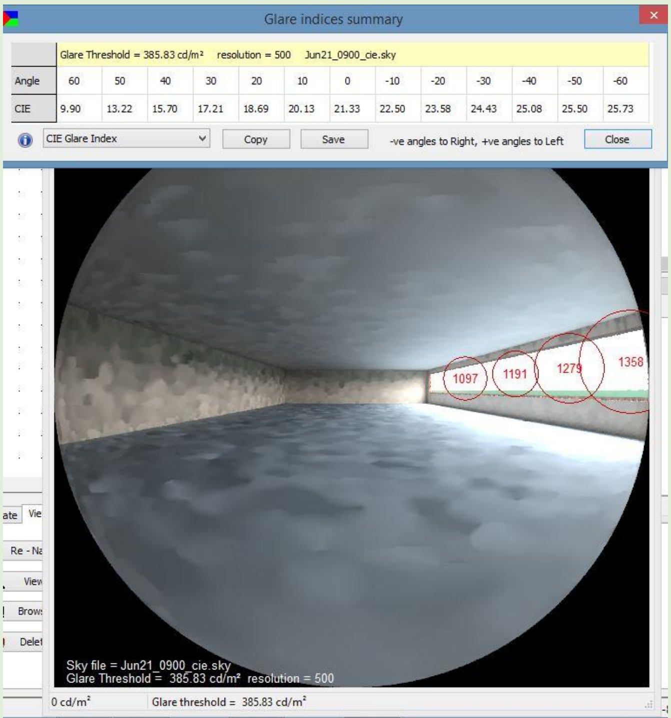
DGP



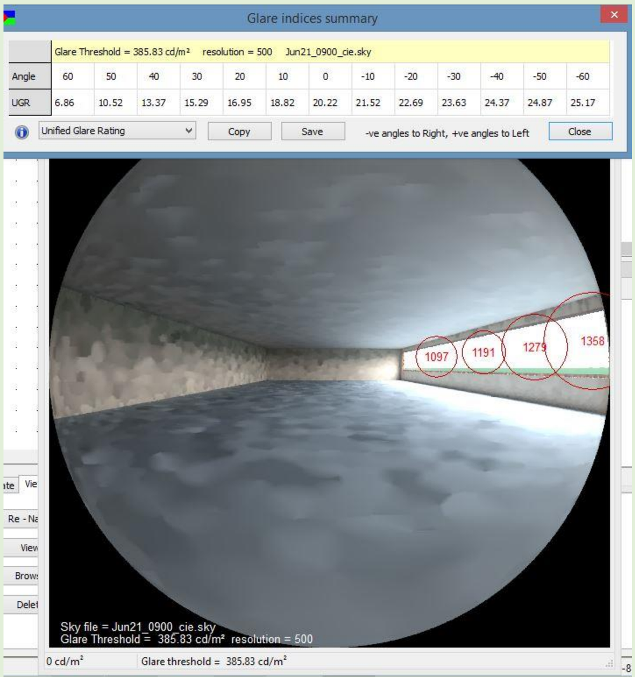
DGI

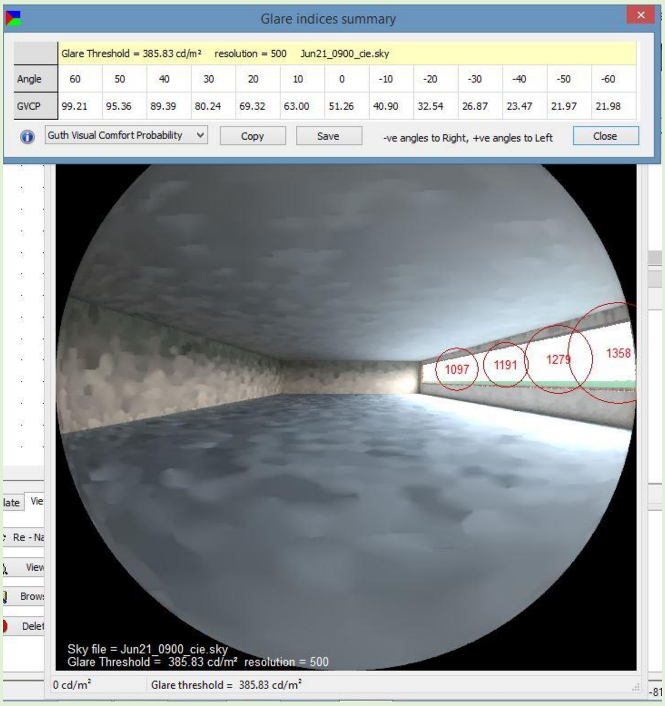
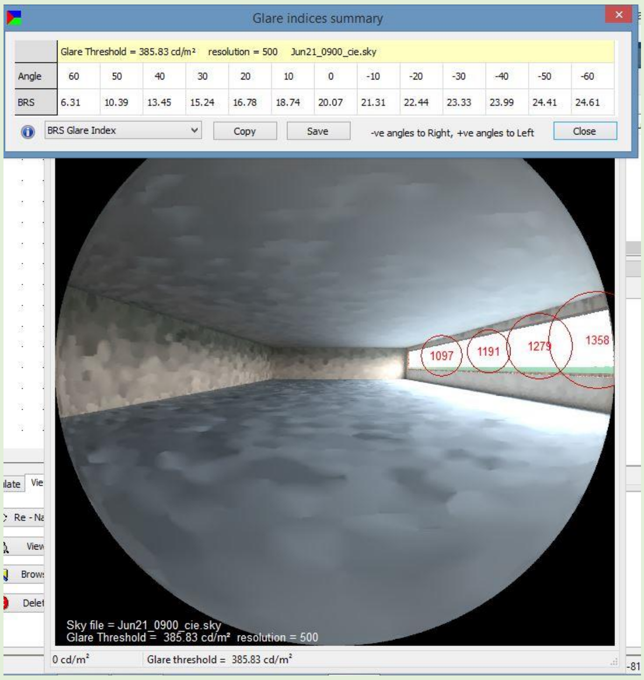


CGI



UGR

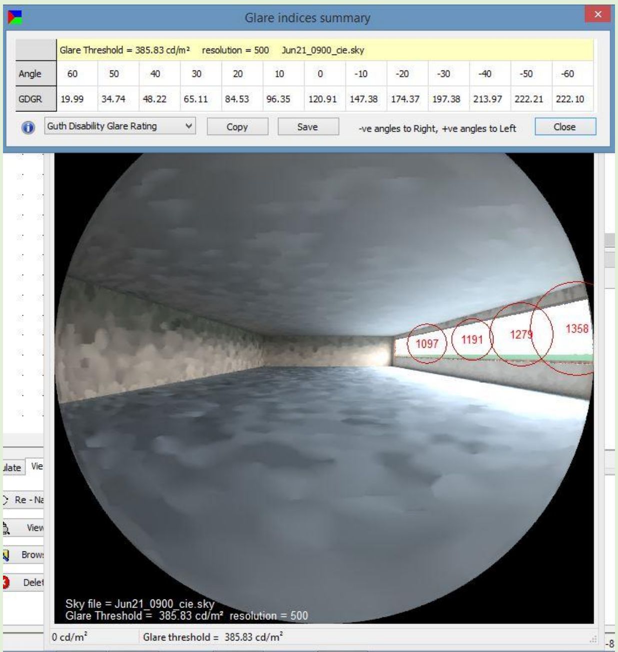


VCP	BRS
	

Glare indices summary
Glare Threshold = 385.83 cd/m² resolution = 500 Jun21_0900_cie.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 99.21 95.36 89.39 80.24 69.32 63.00 51.26 40.90 32.54 26.87 23.47 21.97 21.98
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1097
1191
1279
1358
Sky file = Jun21_0900_cie.sky
Glare Threshold = 385.83 cd/m² resolution = 500
0 cd/m²
Glare threshold = 385.83 cd/m²

Glare indices summary
Glare Threshold = 385.83 cd/m² resolution = 500 Jun21_0900_cie.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 6.31 10.39 13.45 15.24 16.78 18.74 20.07 21.31 22.44 23.33 23.99 24.41 24.61
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1097
1191
1279
1358
Sky file = Jun21_0900_cie.sky
Glare Threshold = 385.83 cd/m² resolution = 500
0 cd/m²
Glare threshold = 385.83 cd/m²

GDGR

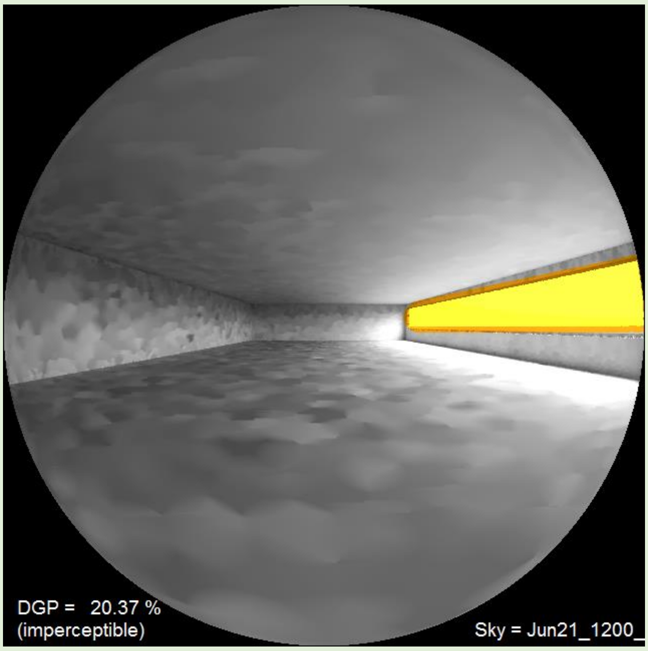


Glare indices summary
Glare Threshold = 385.83 cd/m² resolution = 500 Jun21_0900_cie.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 19.99 34.74 48.22 65.11 84.53 96.35 120.91 147.38 174.37 197.38 213.97 222.21 222.10
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1097
1191
1279
1358
Sky file = Jun21_0900_cie.sky
Glare Threshold = 385.83 cd/m² resolution = 500
0 cd/m²
Glare threshold = 385.83 cd/m²

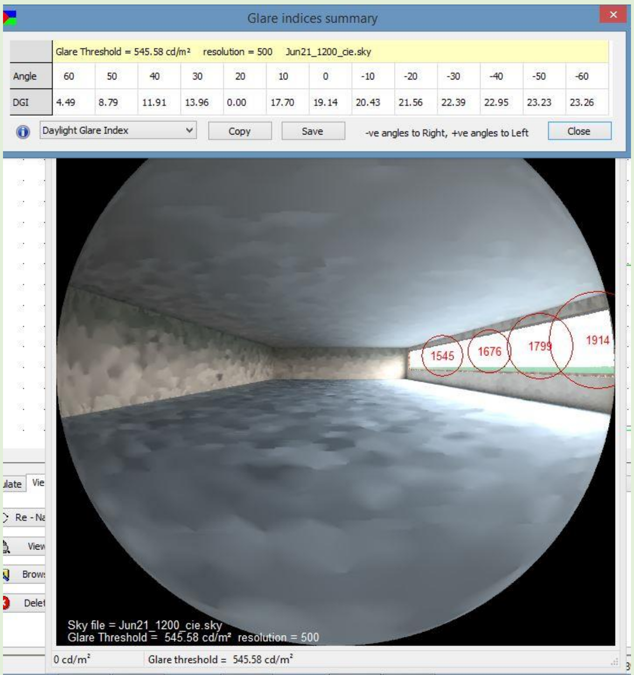
Table 153: Daylight and Glare Analysis for Jun 21, with overcast sky, (S), (P6),(T12).

Daylight and Glare Analysis for Jun 21, (overcast sky), (S), (P6) (T12).

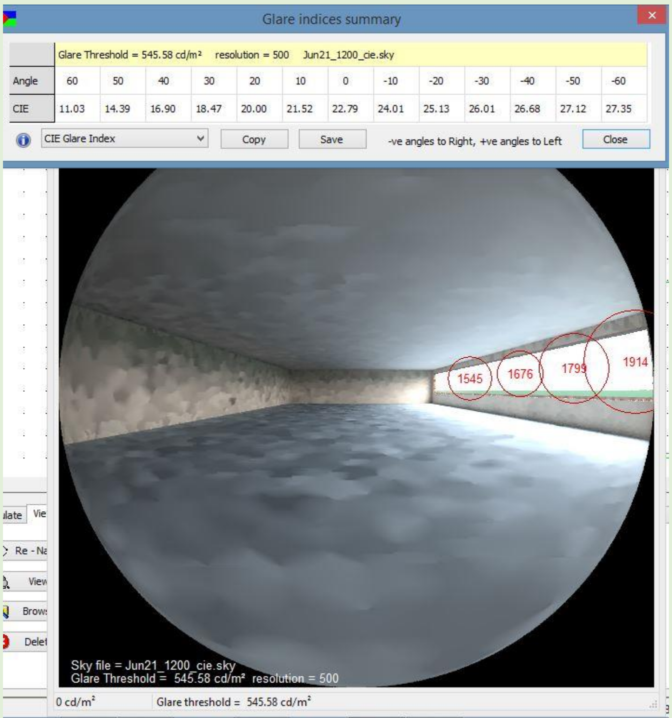
DGP



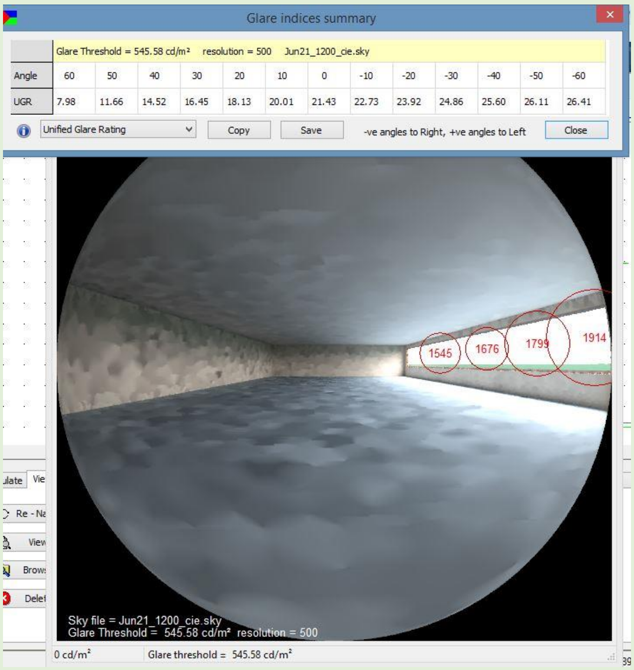
DGI



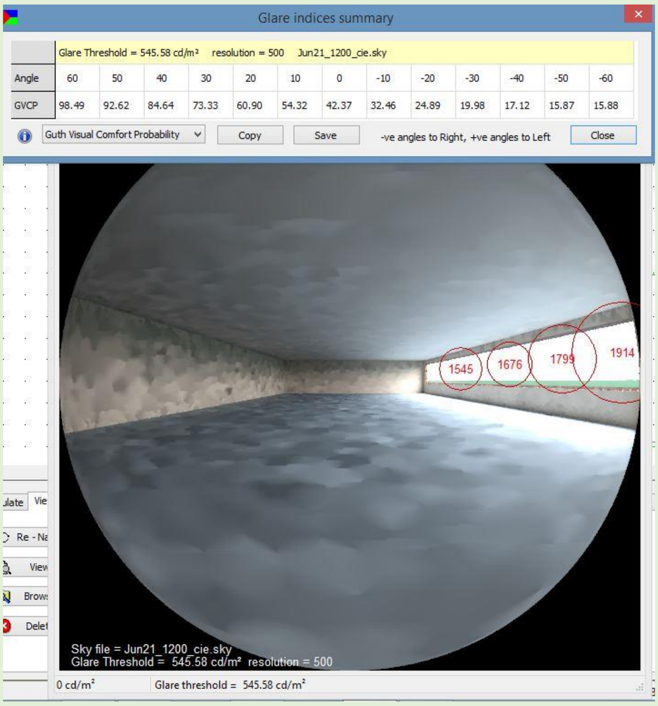
CGI



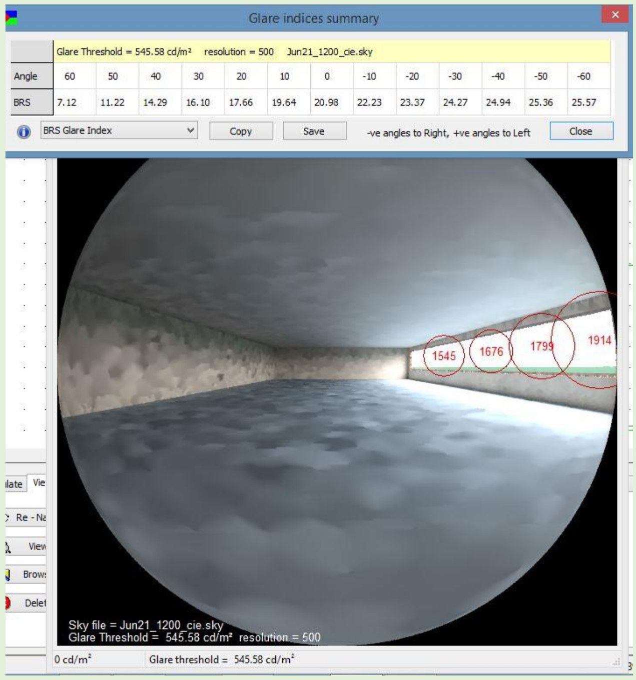
UGR



VCP


Glare indices summary
Glare Threshold = 545.58 cd/m² resolution = 500 Jun21_1200_cie.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 98.49 92.62 84.64 73.33 60.90 54.32 42.37 32.46 24.89 19.98 17.12 15.87 15.88
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1545
1676
1799
1914
Sky file = Jun21_1200_cie.sky
Glare Threshold = 545.58 cd/m² resolution = 500
0 cd/m²
Glare threshold = 545.58 cd/m²

BRS


Glare indices summary
Glare Threshold = 545.58 cd/m² resolution = 500 Jun21_1200_cie.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 7.12 11.22 14.29 16.10 17.66 19.64 20.98 22.23 23.37 24.27 24.94 25.36 25.57
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1545
1676
1799
1914
Sky file = Jun21_1200_cie.sky
Glare Threshold = 545.58 cd/m² resolution = 500
0 cd/m²
Glare threshold = 545.58 cd/m²

GDGR

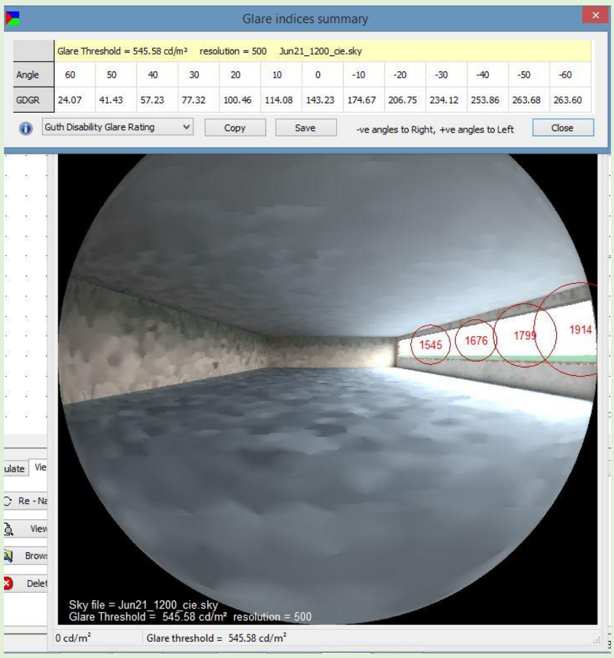
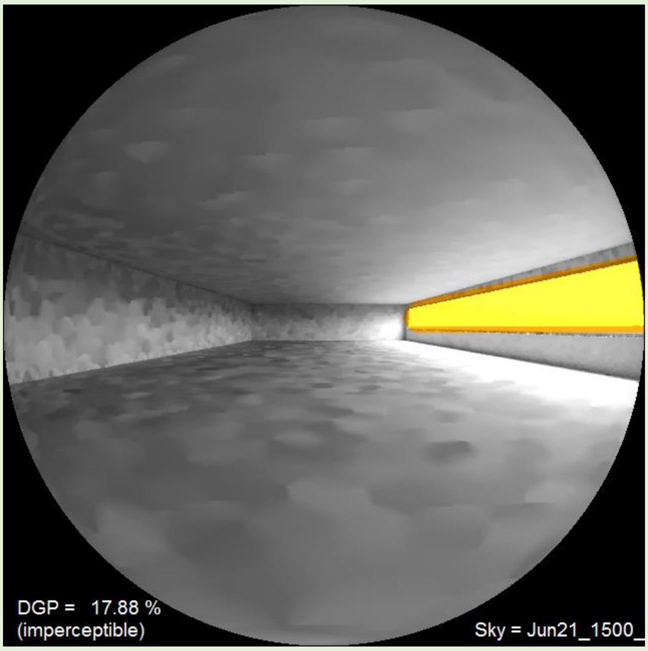
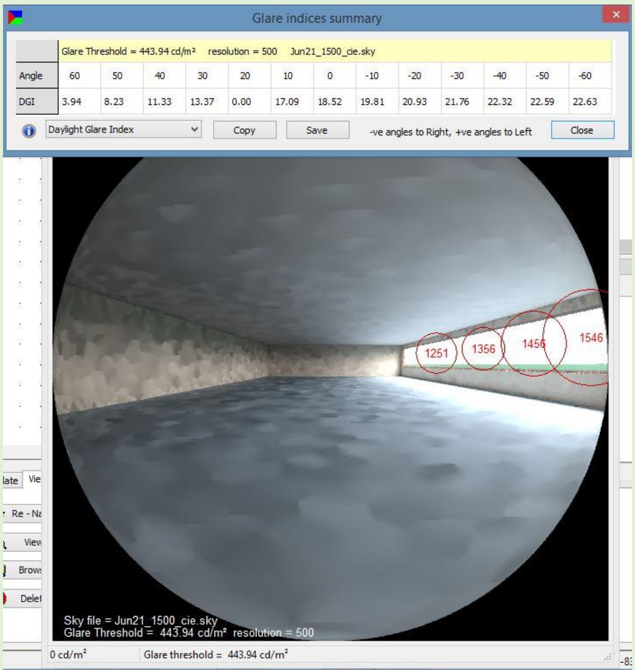
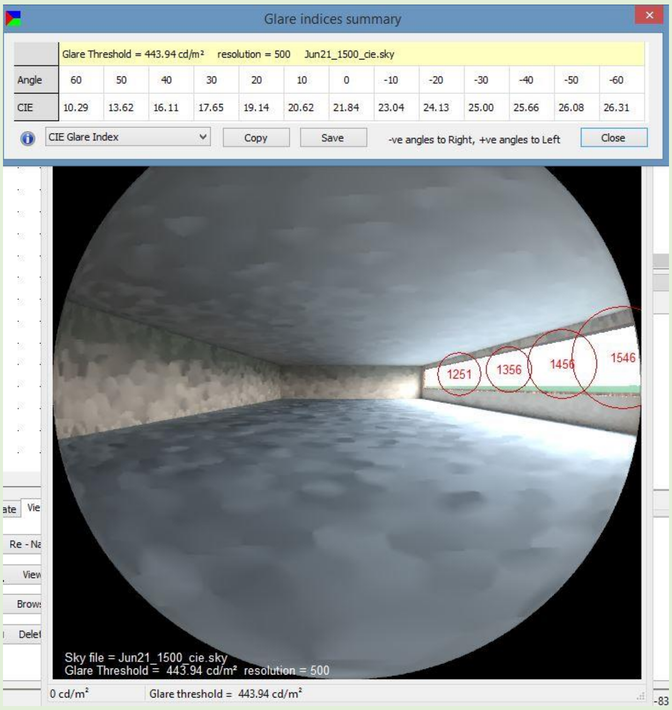
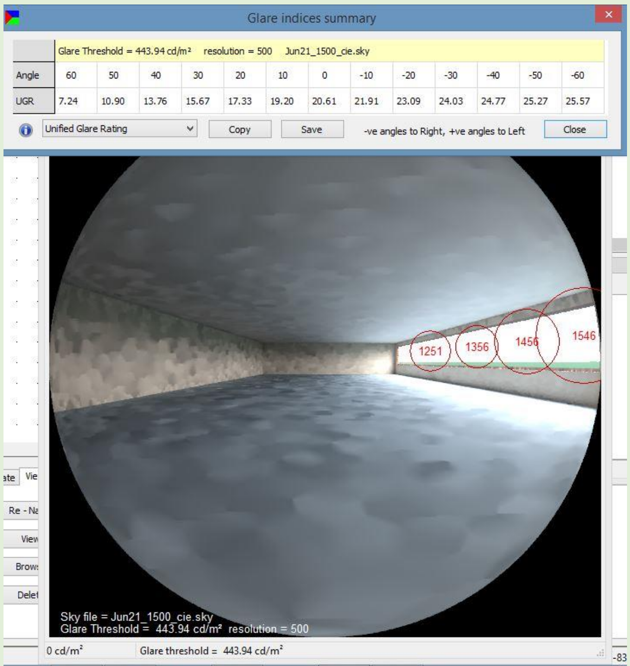
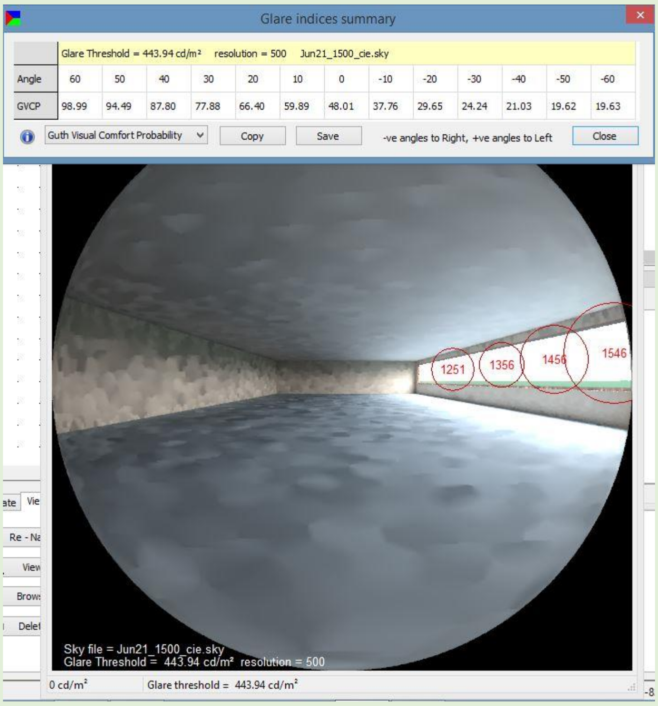

Glare indices summary
Glare Threshold = 545.58 cd/m² resolution = 500 Jun21_1200_cie.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 24.07 41.43 57.23 77.32 100.46 114.08 143.23 174.67 206.75 234.12 253.86 263.68 263.60
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1545
1676
1799
1914
Sky file = Jun21_1200_cie.sky
Glare Threshold = 545.58 cd/m² resolution = 500
0 cd/m²
Glare threshold = 545.58 cd/m²

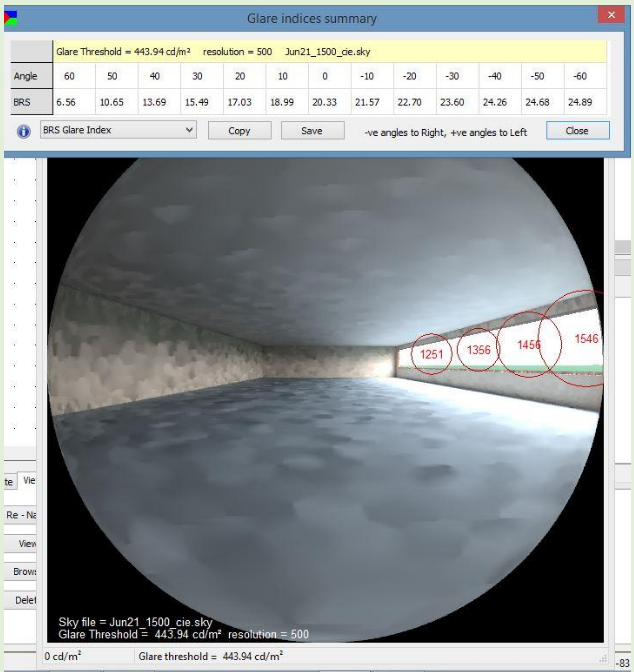
Table 154: Daylight and Glare Analysis for Jun 21, with overcast sky, (S), (P6),(T15).

Daylight and Glare Analysis for Jun 21, (overcast sky), (S), (P6) (T15).	
DGP	**DGI**
	
CGI	**UGR**
	

VCP


Glare indices summary
Glare Threshold = 443.94 cd/m² resolution = 500 Jun21_1500_cie.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 98.99 94.49 87.80 77.88 66.40 59.89 48.01 37.76 29.65 24.24 21.03 19.62 19.63
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1251
1356
1456
1546
Sky file = Jun21_1500_cie.sky
Glare Threshold = 443.94 cd/m² resolution = 500
0 cd/m²
Glare threshold = 443.94 cd/m²

BRS


Glare indices summary
Glare Threshold = 443.94 cd/m² resolution = 500 Jun21_1500_cie.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 6.56 10.65 13.69 15.49 17.03 18.99 20.33 21.57 22.70 23.60 24.26 24.68 24.89
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1251
1356
1456
1546
Sky file = Jun21_1500_cie.sky
Glare Threshold = 443.94 cd/m² resolution = 500
0 cd/m²
Glare threshold = 443.94 cd/m²

GDGR

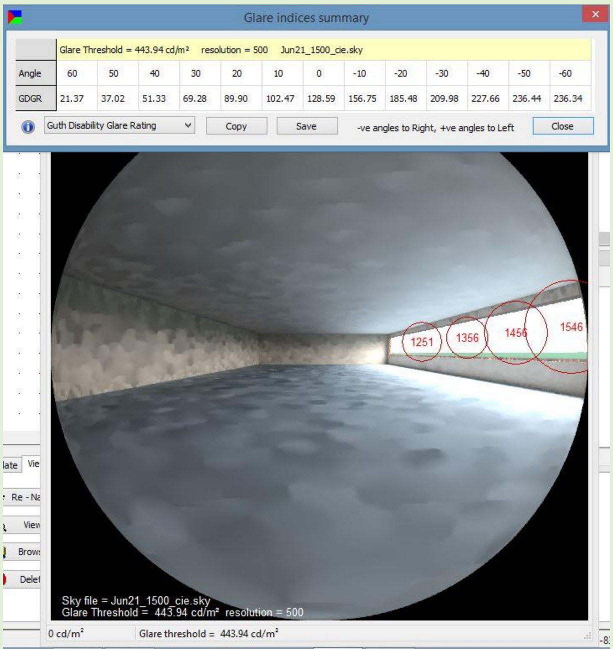
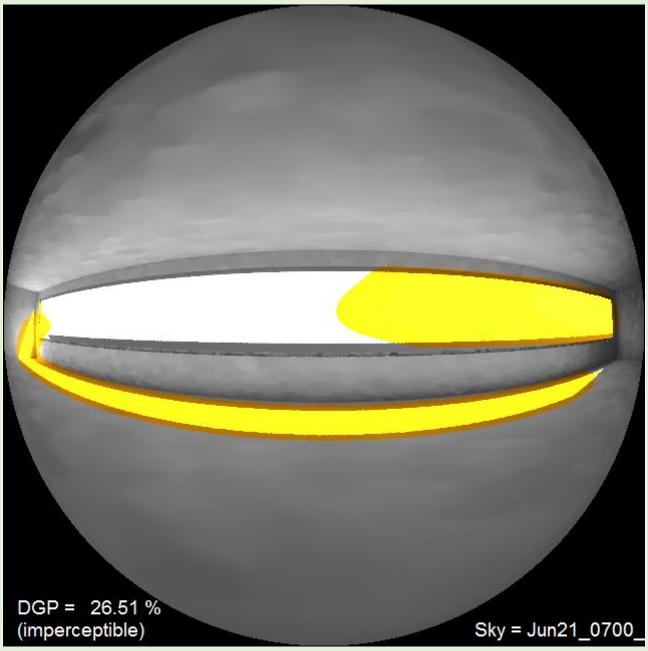

Glare indices summary
Glare Threshold = 443.94 cd/m² resolution = 500 Jun21_1500_cie.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 21.37 37.02 51.33 69.28 89.90 102.47 128.59 156.75 185.48 209.98 227.66 236.44 236.34
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1251
1356
1456
1546
Sky file = Jun21_1500_cie.sky
Glare Threshold = 443.94 cd/m² resolution = 500
0 cd/m²
Glare threshold = 443.94 cd/m²

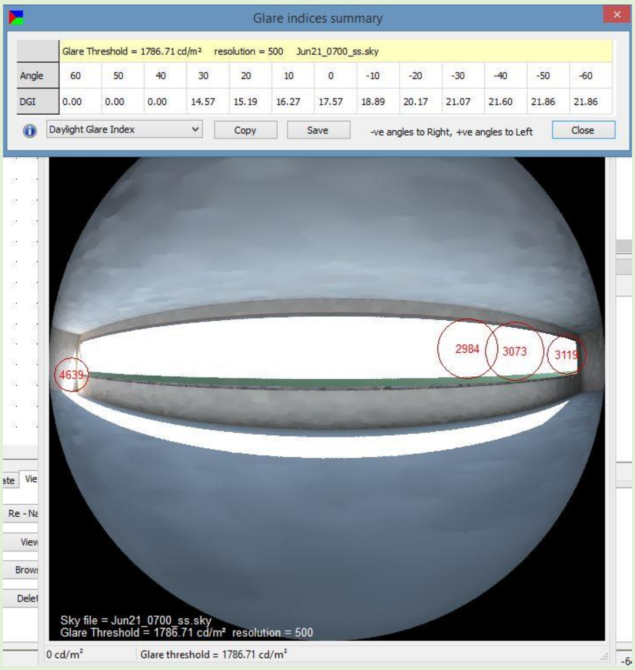
Table 155: Daylight and Glare Analysis for Jun 21, with sunny sky, (N), (P4),(T7).

Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P4) (T7).

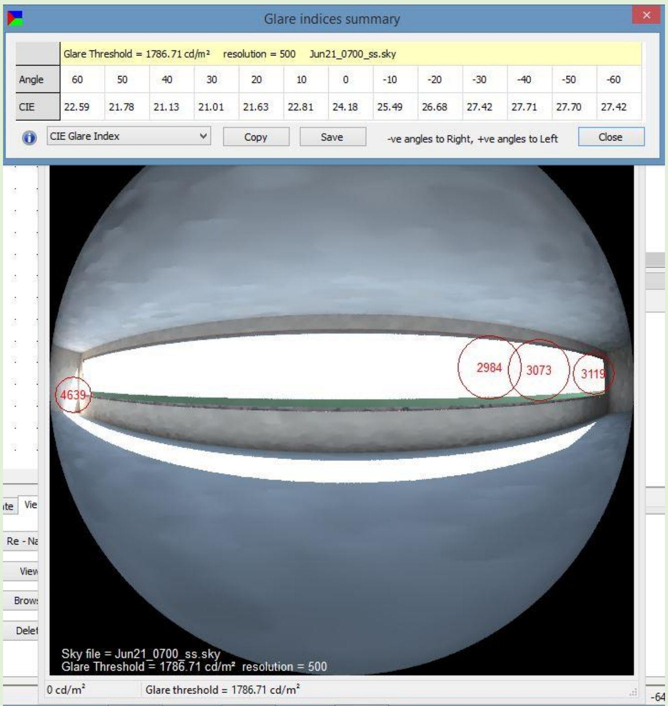
DGP



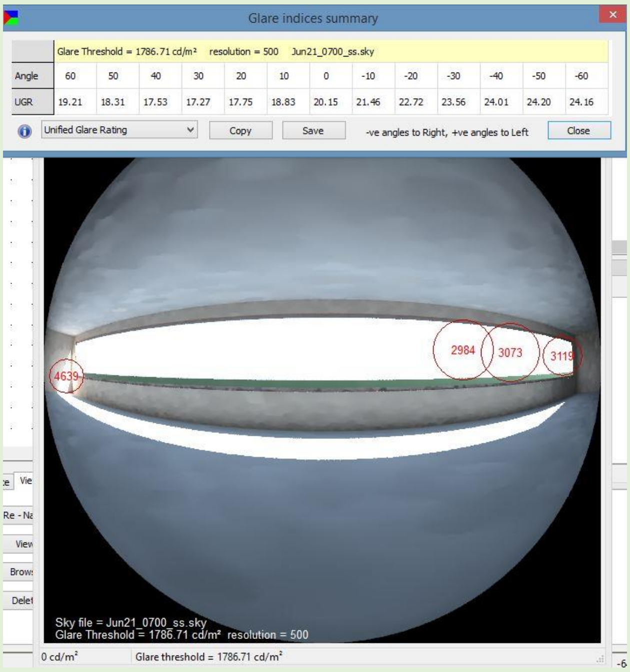
DGI



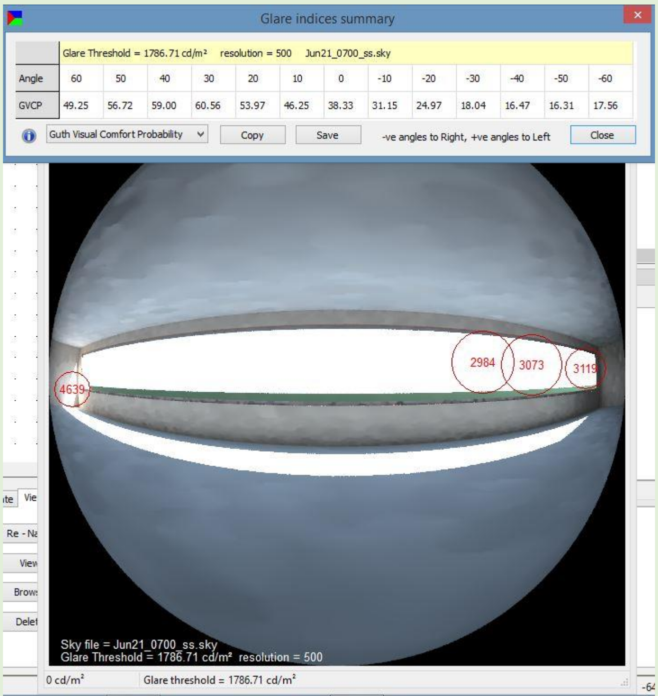
CGI



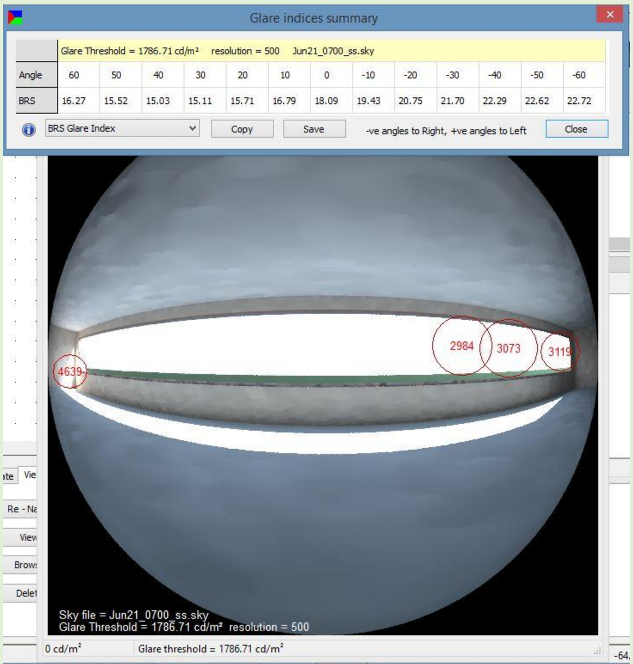
UGR



VCP


Glare indices summary
Glare Threshold = 1786.71 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 49.25 56.72 59.00 60.56 53.97 46.25 38.33 31.15 24.97 18.04 16.47 16.31 17.56
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2984
3073
3119
4639
Sky file = Jun21_0700_ss.sky
Glare Threshold = 1786.71 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1786.71 cd/m²

BRS


Glare indices summary
Glare Threshold = 1786.71 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 16.27 15.52 15.03 15.11 15.71 16.79 18.09 19.43 20.75 21.70 22.29 22.62 22.72
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2984
3073
3119
4639
Sky file = Jun21_0700_ss.sky
Glare Threshold = 1786.71 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1786.71 cd/m²

GDGR

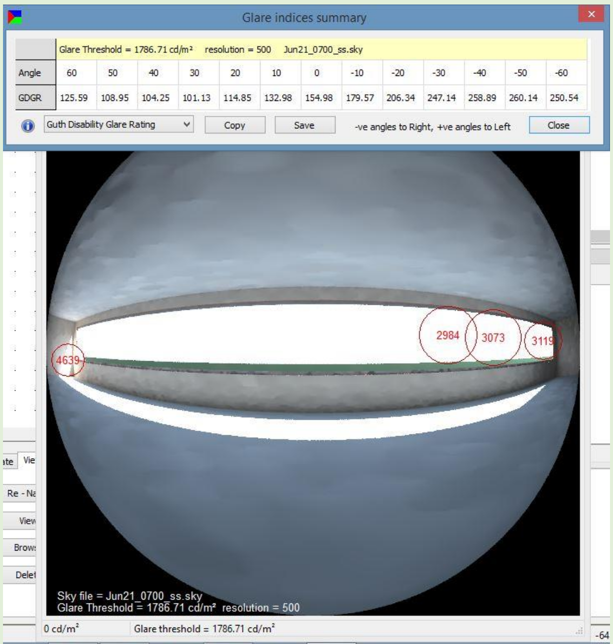
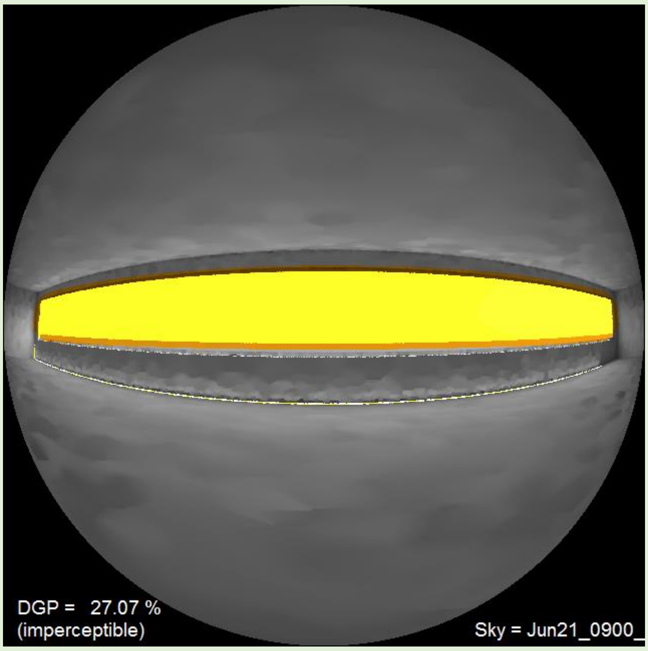

Glare indices summary
Glare Threshold = 1786.71 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 125.59 108.95 104.25 101.13 114.85 132.98 154.98 179.57 206.34 247.14 258.89 260.14 250.54
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2984
3073
3119
4639
Sky file = Jun21_0700_ss.sky
Glare Threshold = 1786.71 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1786.71 cd/m²

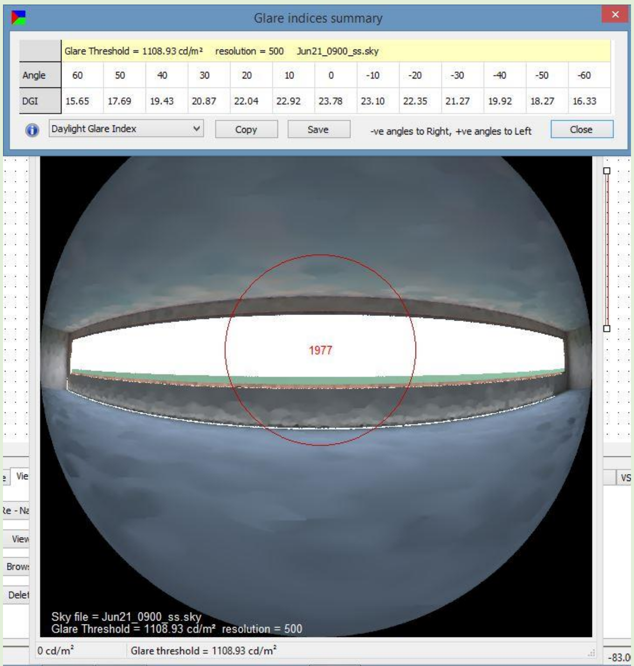
Table 156: Daylight and Glare Analysis for Jun 21, with sunny sky, (N), (P4),(T9).

Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P4) (T9).

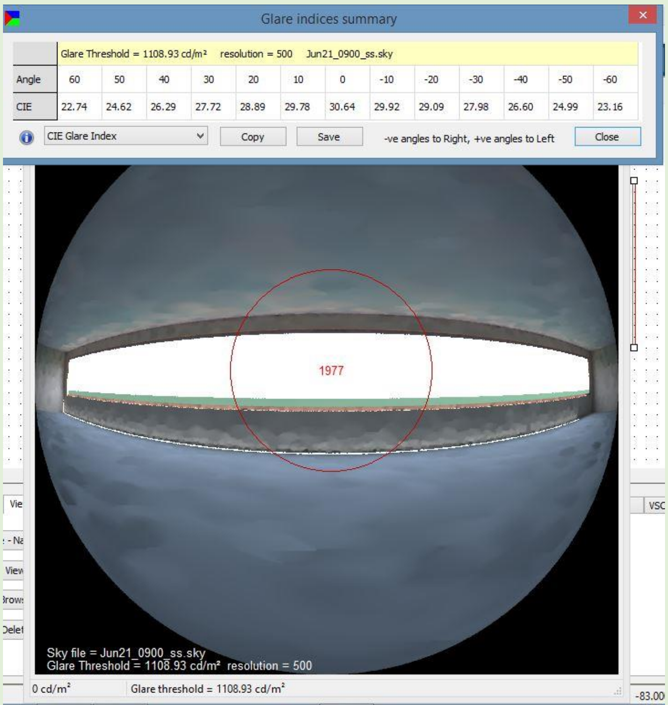
DGP



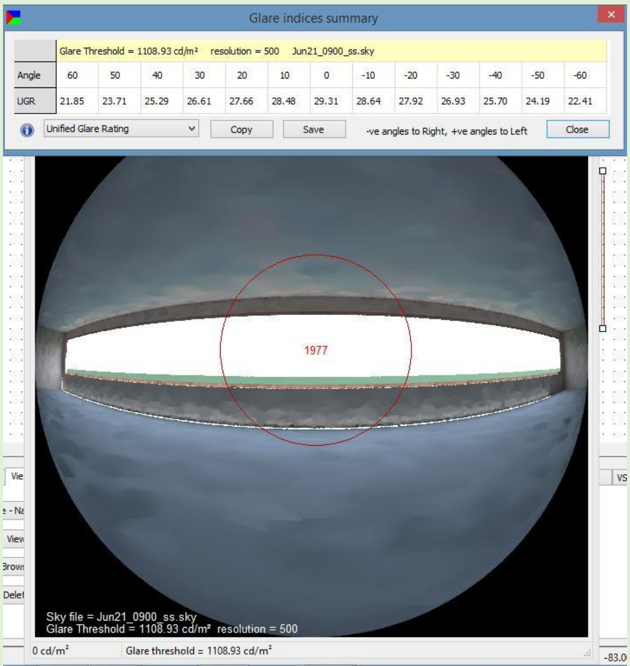
DGI



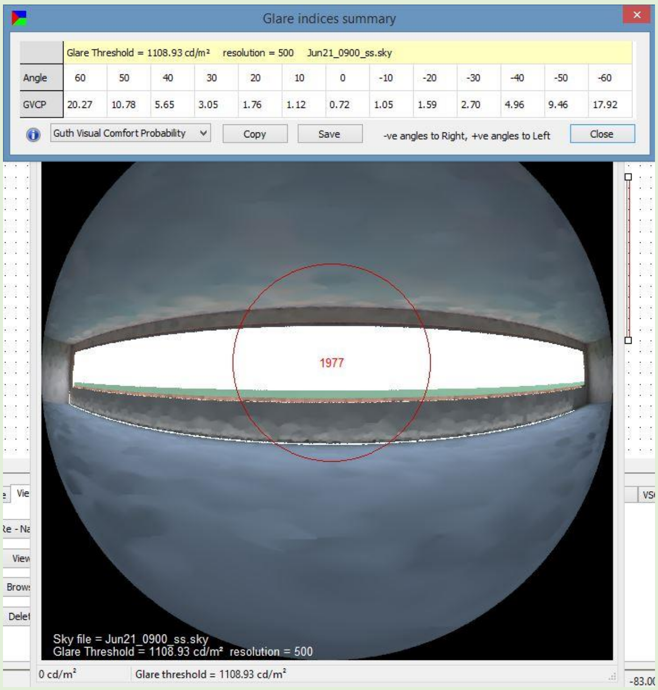
CGI



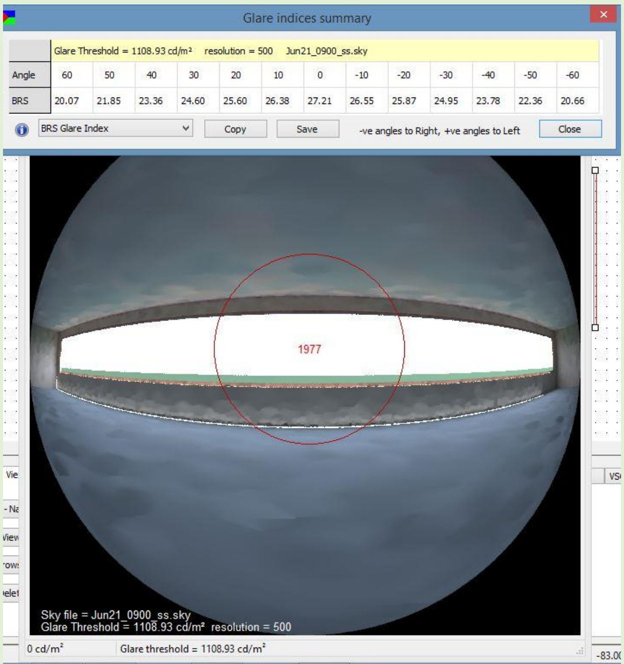
UGR



VCP


Glare indices summary
Glare Threshold = 1108.93 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 20.27 10.78 5.65 3.05 1.76 1.12 0.72 1.05 1.59 2.70 4.96 9.46 17.92
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1977
Sky file = Jun21_0900_ss.sky
Glare Threshold = 1108.93 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1108.93 cd/m²

BRS


Glare indices summary
Glare Threshold = 1108.93 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 20.07 21.85 23.36 24.60 25.60 26.38 27.21 26.55 25.87 24.95 23.78 22.36 20.66
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1977
Sky file = Jun21_0900_ss.sky
Glare Threshold = 1108.93 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1108.93 cd/m²

GDGR

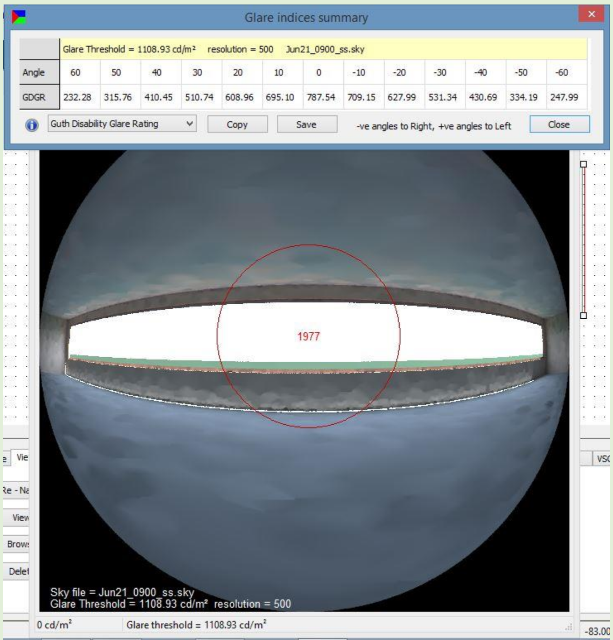
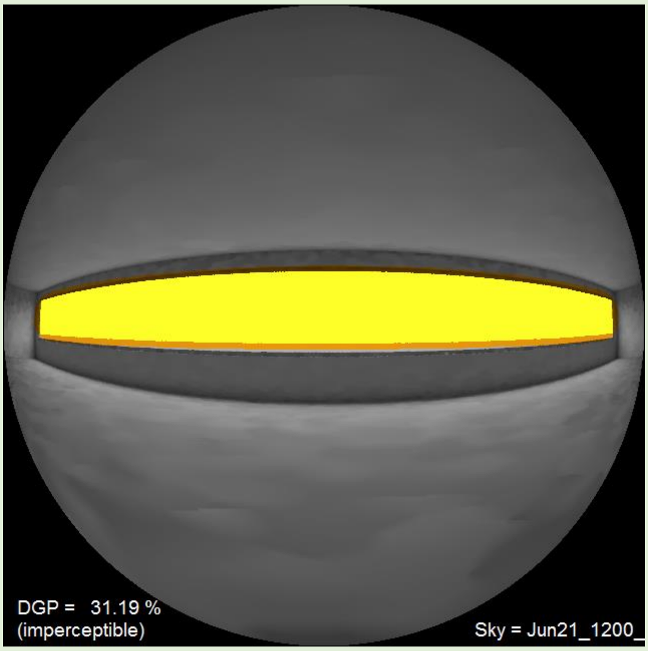

Glare indices summary
Glare Threshold = 1108.93 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 232.28 315.76 410.45 510.74 608.96 695.10 787.54 709.15 627.99 531.34 430.69 334.19 247.99
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1977
Sky file = Jun21_0900_ss.sky
Glare Threshold = 1108.93 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1108.93 cd/m²

Table 157: Daylight and Glare Analysis for Jun 21, with sunny sky, (N), (P4),(T12).

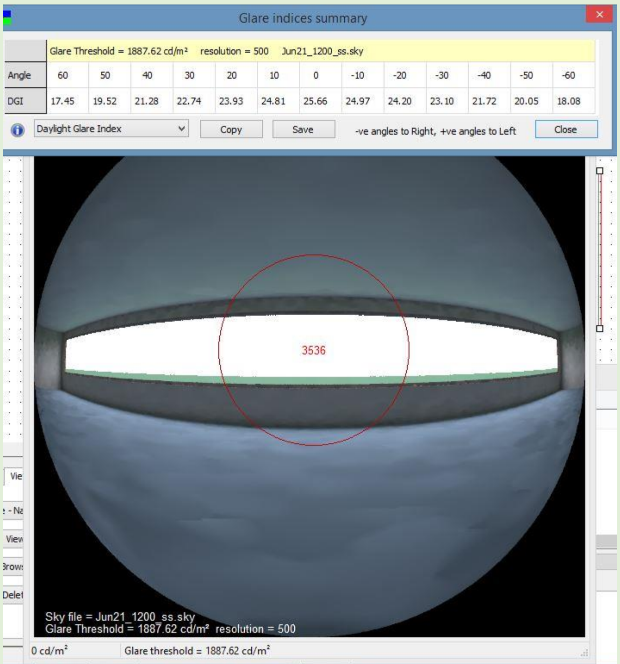
<table>
<tr><th colspan="2">Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P4) (T12).</th></tr>
<tr><td>

DGP



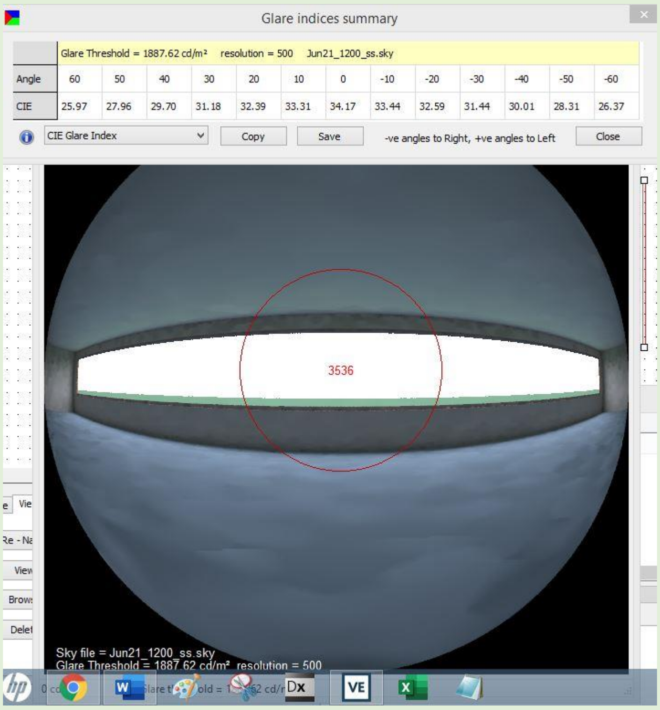
</td><td>

DGI



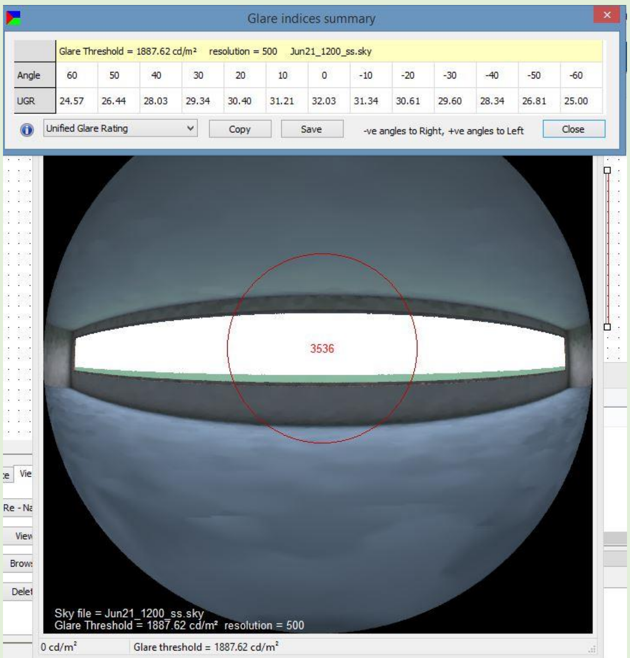
</td></tr>
<tr><td>

CGI

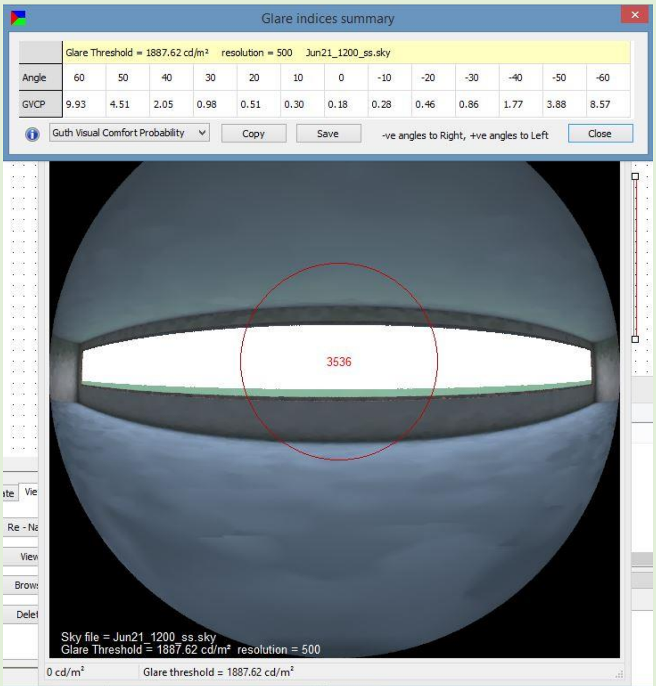
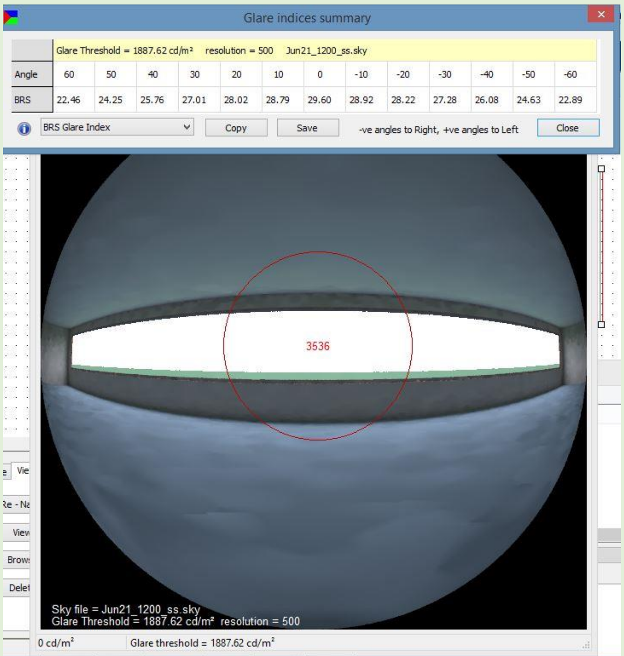


</td><td>

UGR



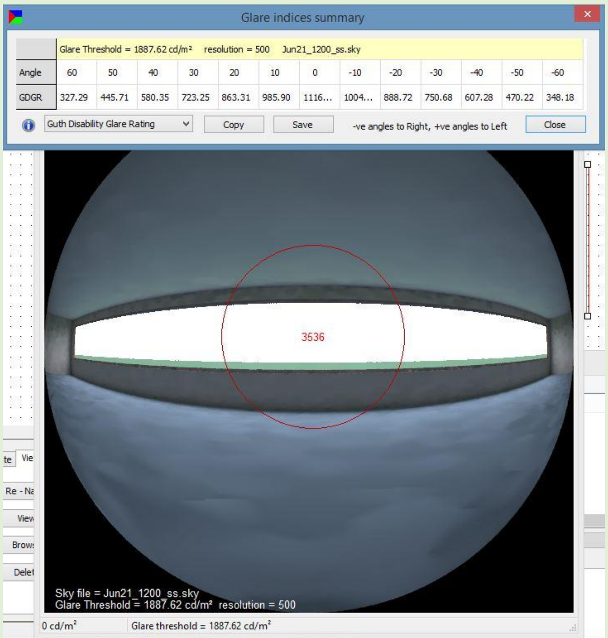
</td></tr>
</table>

VCP	BRS
	

Glare indices summary
Glare Threshold = 1887.62 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 9.93 4.51 2.05 0.98 0.51 0.30 0.18 0.28 0.46 0.86 1.77 3.88 8.57
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3536
Sky file = Jun21_1200_ss.sky
Glare Threshold = 1887.62 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1887.62 cd/m²

Glare indices summary
Glare Threshold = 1887.62 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 22.46 24.25 25.76 27.01 28.02 28.79 29.60 28.92 28.22 27.28 26.08 24.63 22.89
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3536
Sky file = Jun21_1200_ss.sky
Glare Threshold = 1887.62 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1887.62 cd/m²

GDGR

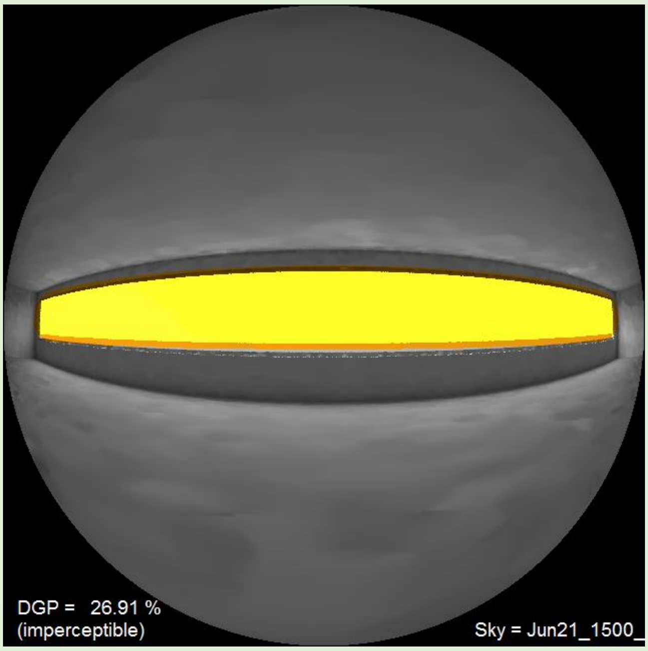


Glare indices summary
Glare Threshold = 1887.62 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 327.29 445.71 580.35 723.25 863.31 985.90 1116... 1004... 888.72 750.68 607.28 470.22 348.18
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3536
Sky file = Jun21_1200_ss.sky
Glare Threshold = 1887.62 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1887.62 cd/m²

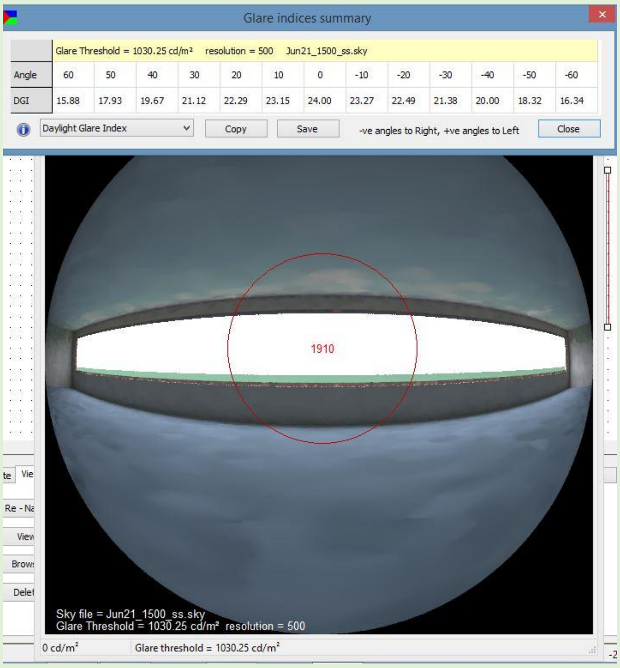
Table 158: Daylight and Glare Analysis for Jun 21, with sunny sky, (N), (P4),(T15).

Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P4) (T15).

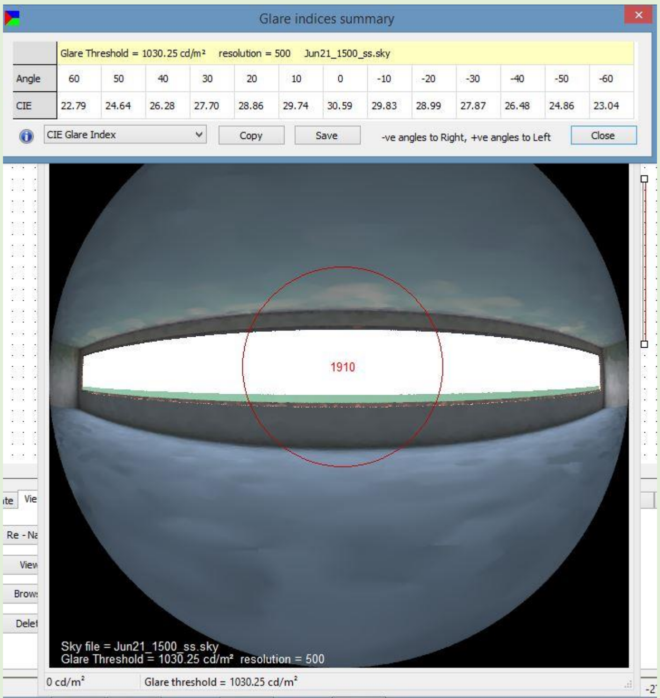
DGP



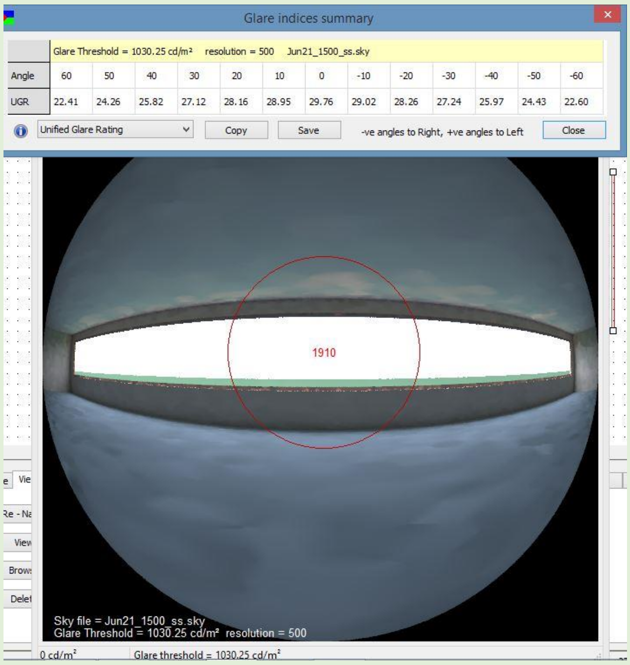
DGI



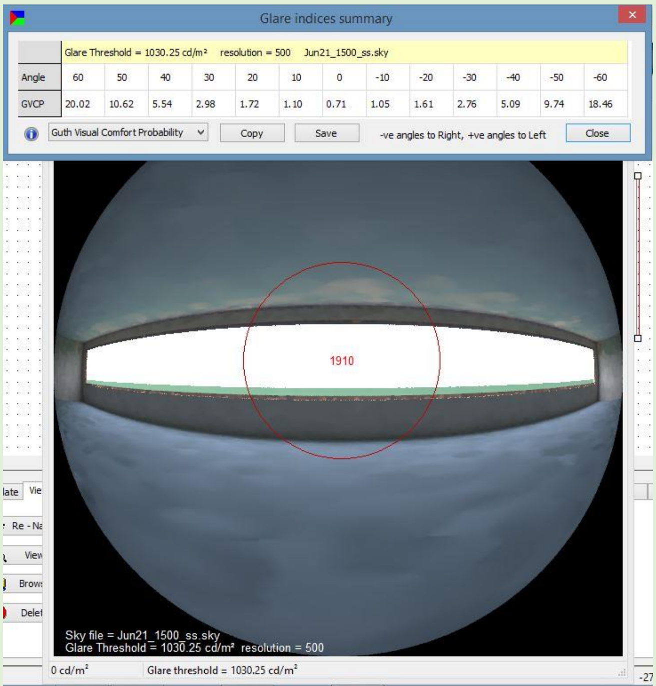
CGI



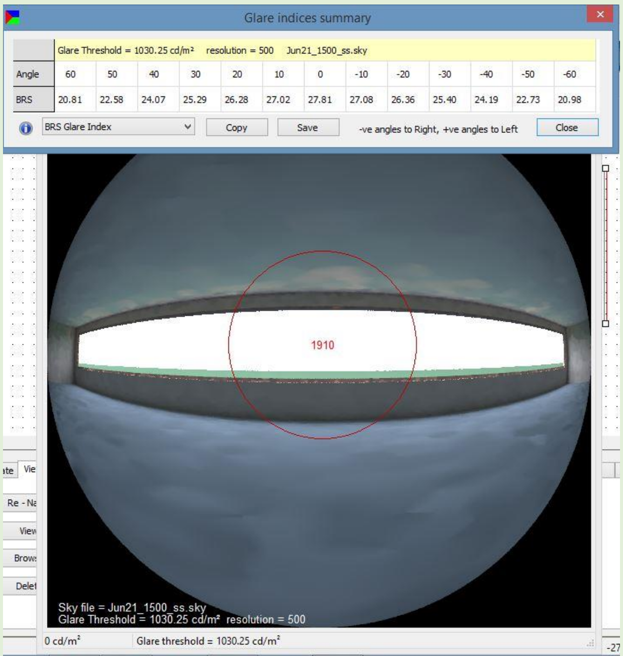
UGR



VCP


Glare indices summary
Glare Threshold = 1030.25 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 20.02 10.62 5.54 2.98 1.72 1.10 0.71 1.05 1.61 2.76 5.09 9.74 18.46
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1910
Sky file = Jun21_1500_ss.sky
Glare Threshold = 1030.25 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1030.25 cd/m²

BRS


Glare indices summary
Glare Threshold = 1030.25 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 20.81 22.58 24.07 25.29 26.28 27.02 27.81 27.08 26.36 25.40 24.19 22.73 20.98
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1910
Sky file = Jun21_1500_ss.sky
Glare Threshold = 1030.25 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1030.25 cd/m²

GDGR

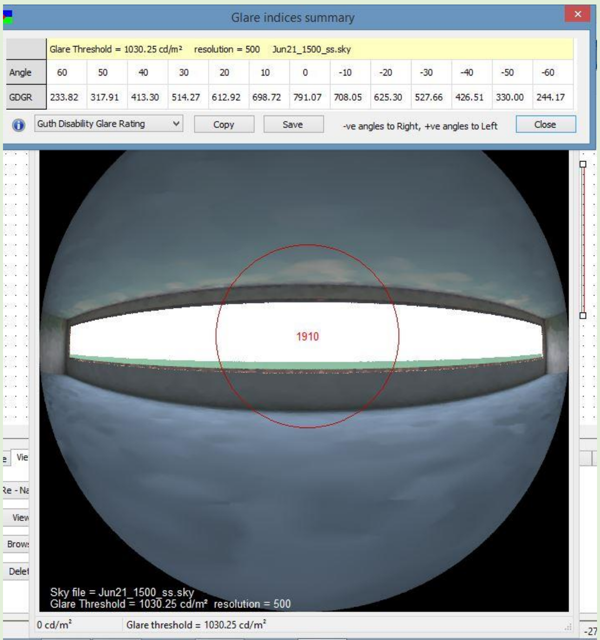
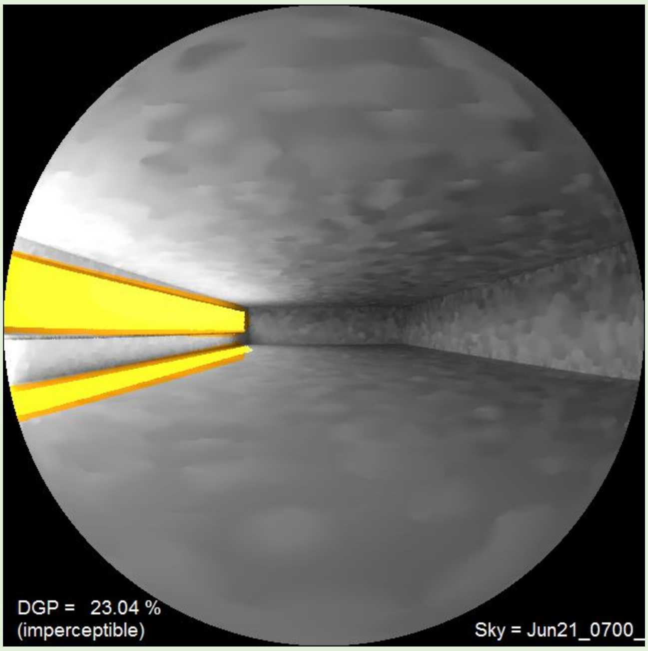

Glare indices summary
Glare Threshold = 1030.25 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 233.82 317.91 413.30 514.27 612.92 698.72 791.07 708.05 625.30 527.66 426.51 330.00 244.17
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1910
Sky file = Jun21_1500_ss.sky
Glare Threshold = 1030.25 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1030.25 cd/m²

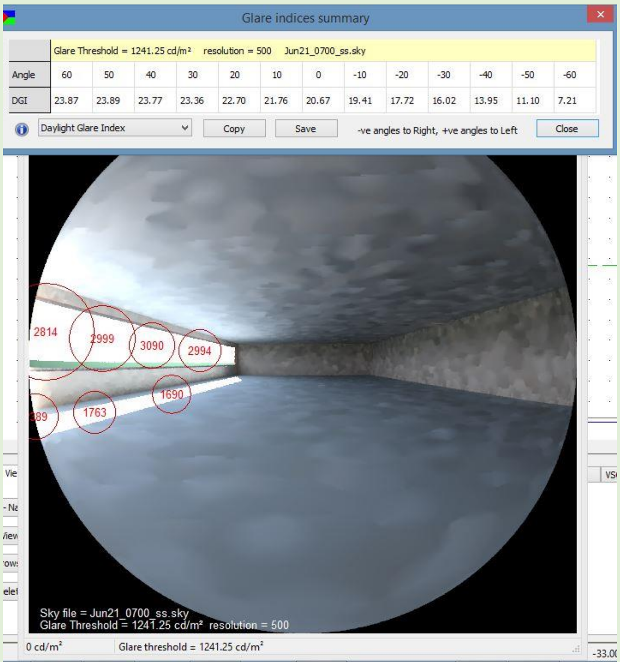
Table 159: Daylight and Glare Analysis for Jun 21, with sunny sky, (N), (P5),(T7).

Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P5) (T7).

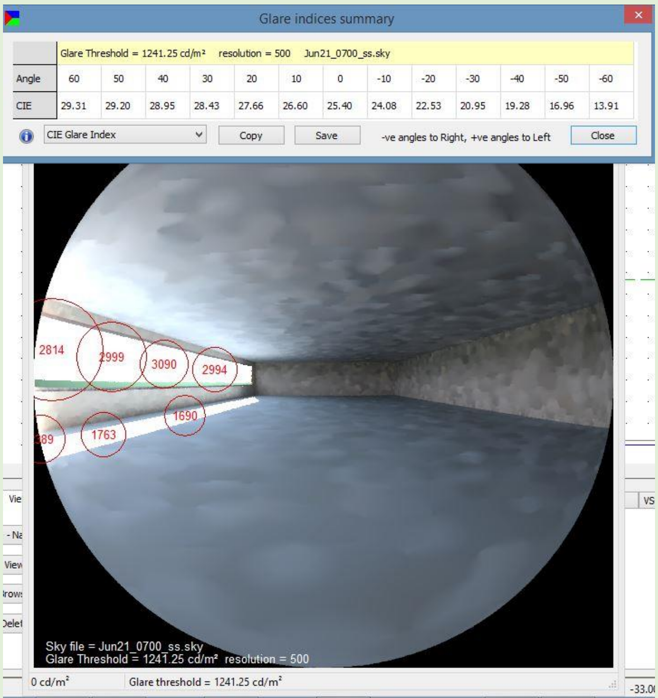
DGP



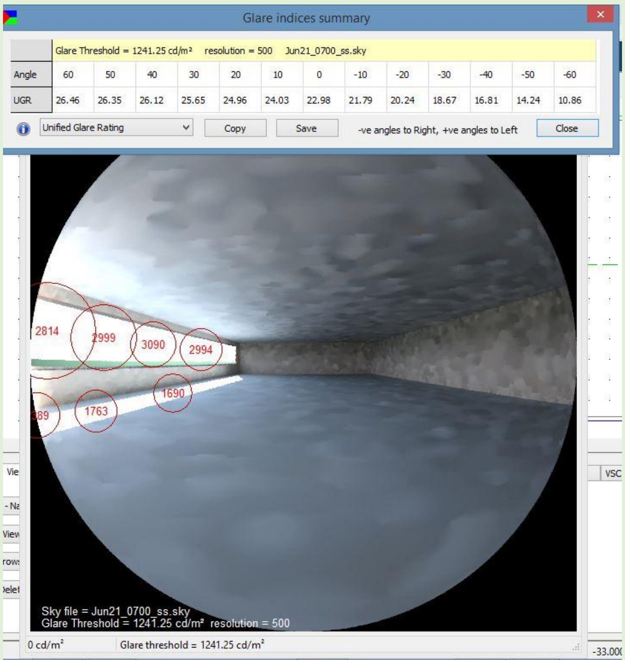
DGI



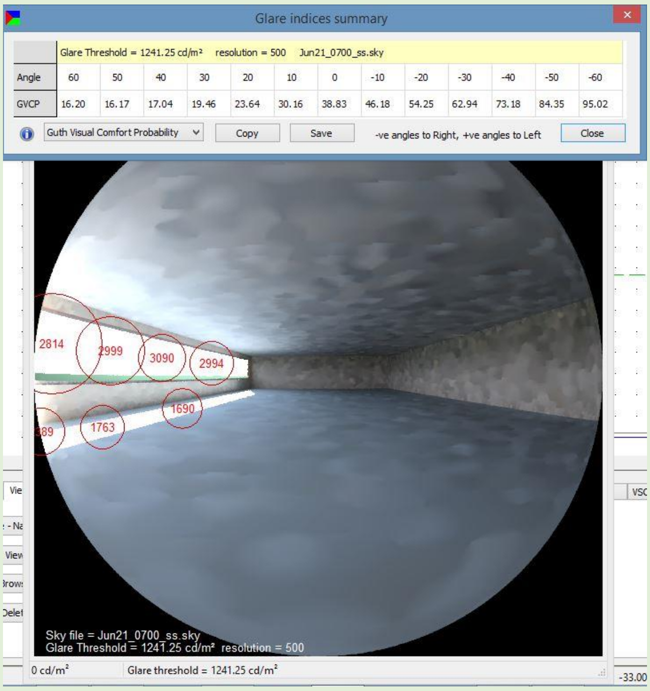
CGI



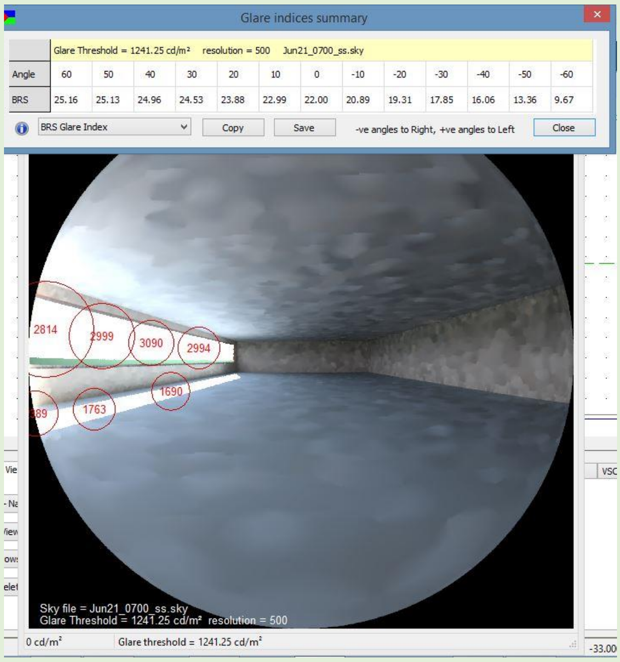
UGR



VCP


Glare indices summary
Glare Threshold = 1241.25 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 16.20 16.17 17.04 19.46 23.64 30.16 38.83 46.18 54.25 62.94 73.18 84.35 95.02
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2814
2999
3090
2994
1690
1763
Sky file = Jun21_0700_ss.sky
Glare Threshold = 1241.25 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1241.25 cd/m²
-33.00

BRS


Glare indices summary
Glare Threshold = 1241.25 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 25.16 25.13 24.96 24.53 23.88 22.99 22.00 20.89 19.31 17.85 16.06 13.36 9.67
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2814
2999
3090
2994
1690
1763
Sky file = Jun21_0700_ss.sky
Glare Threshold = 1241.25 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1241.25 cd/m²
-33.00

GDGR

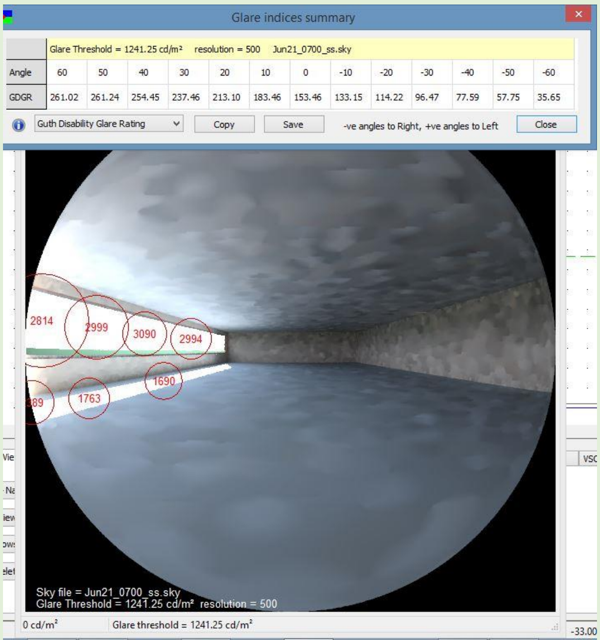
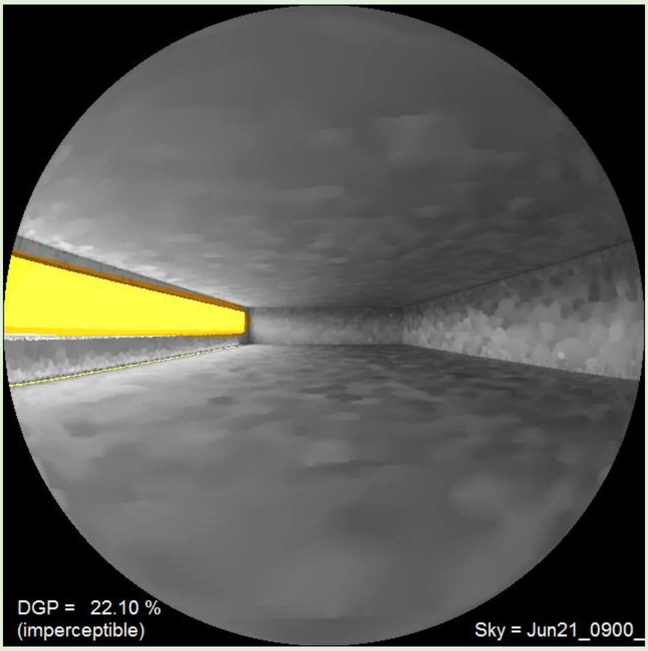

Glare indices summary
Glare Threshold = 1241.25 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 261.02 261.24 254.45 237.46 213.10 183.46 153.46 133.15 114.22 96.47 77.59 57.75 35.65
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2814
2999
3090
2994
1690
1763
Sky file = Jun21_0700_ss.sky
Glare Threshold = 1241.25 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1241.25 cd/m²
-33.00

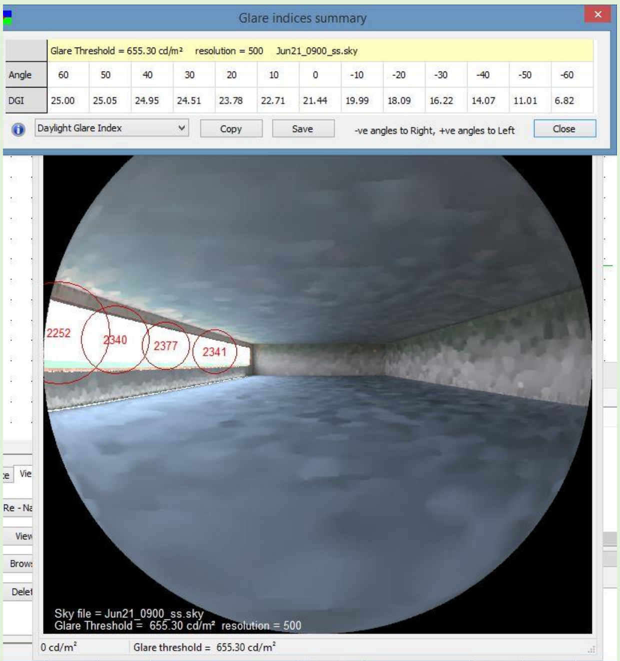
Table 160: Daylight and Glare Analysis for Jun 21, with sunny sky, (N), (P5),(T9).

Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P5) (T9).

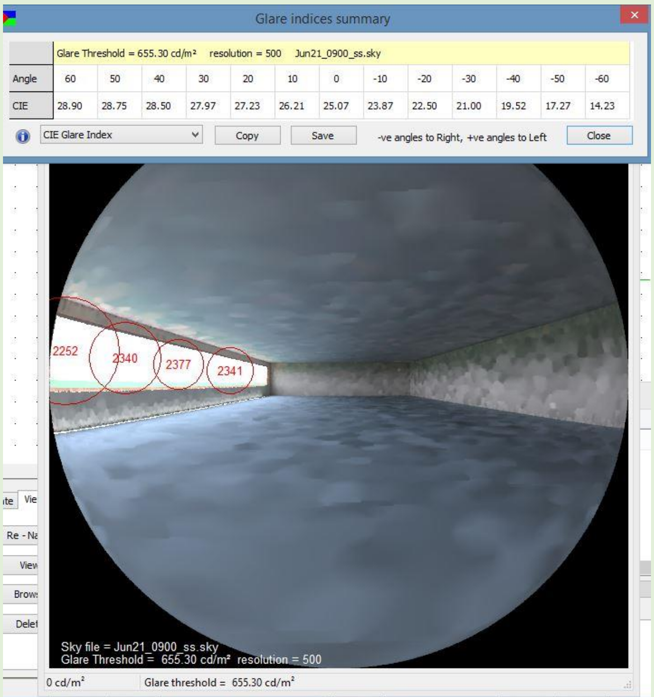
DGP



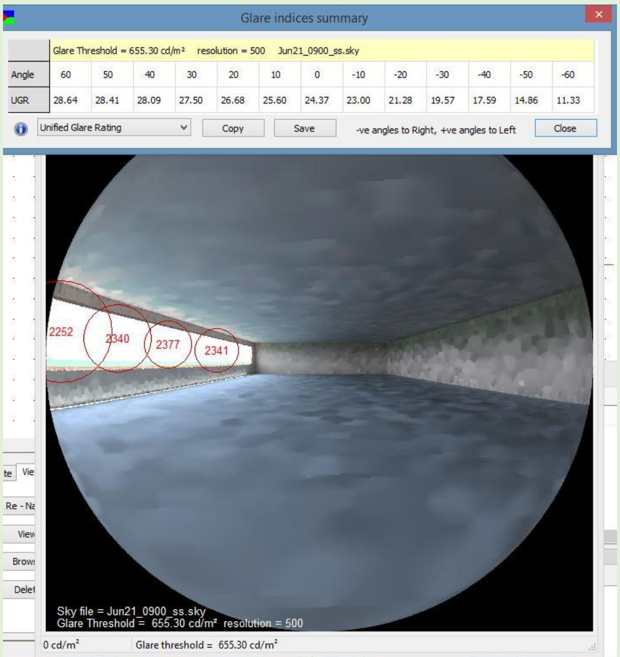
DGI



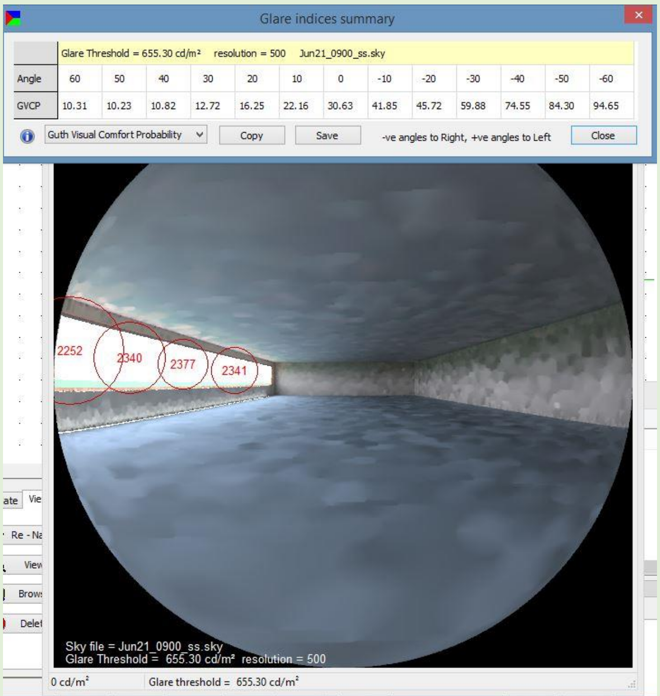
CGI

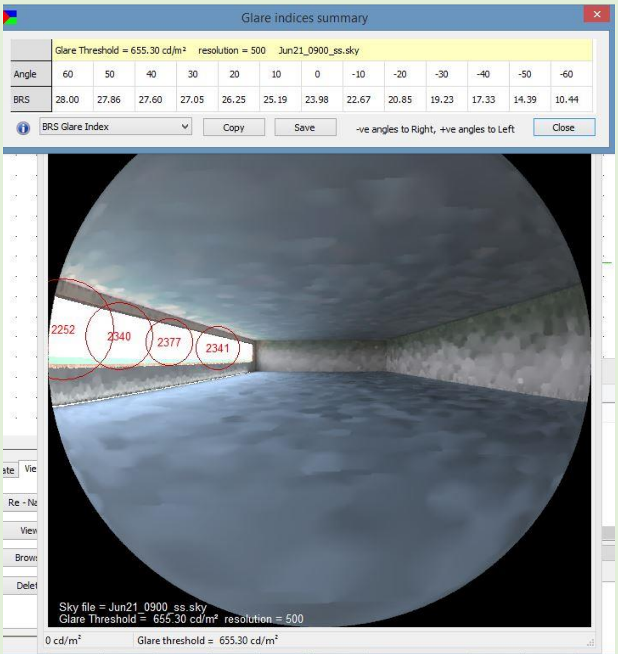


UGR



VCP	BRS


Glare indices summary
Glare Threshold = 655.30 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 10.31 10.23 10.82 12.72 16.25 22.16 30.63 41.85 45.72 59.88 74.55 84.30 94.65
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2252
2340
2377
2341
Sky file = Jun21_0900_ss.sky
Glare Threshold = 655.30 cd/m² resolution = 500
0 cd/m²
Glare threshold = 655.30 cd/m²


Glare indices summary
Glare Threshold = 655.30 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 28.00 27.86 27.60 27.05 26.25 25.19 23.98 22.67 20.85 19.23 17.33 14.39 10.44
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2252
2340
2377
2341
Sky file = Jun21_0900_ss.sky
Glare Threshold = 655.30 cd/m² resolution = 500
0 cd/m²
Glare threshold = 655.30 cd/m²

GDGR

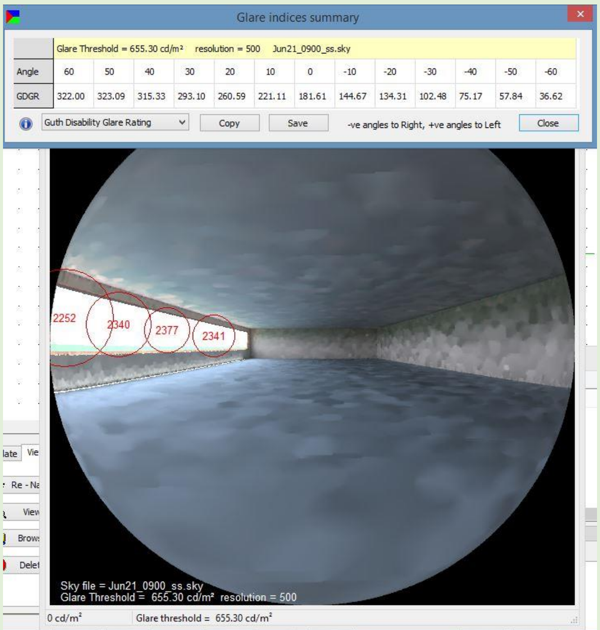
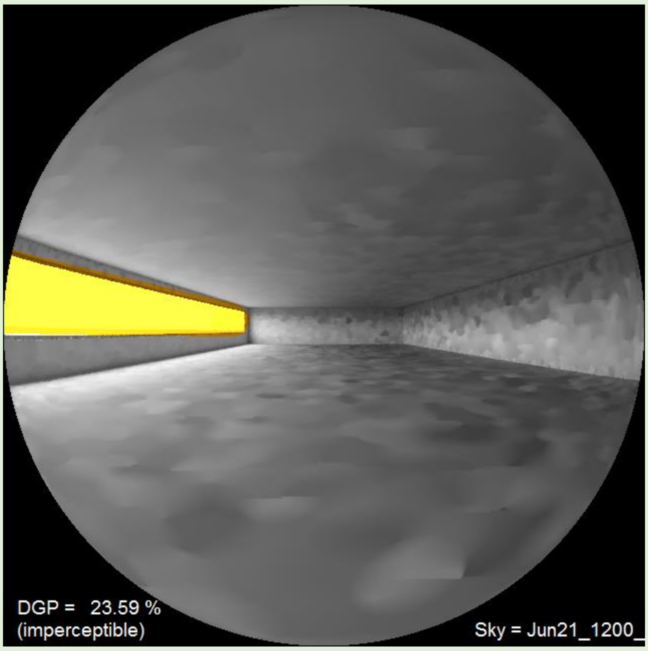

Glare indices summary
Glare Threshold = 655.30 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 322.00 323.09 315.33 293.10 260.59 221.11 181.61 144.67 134.31 102.48 75.17 57.84 36.62
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2252
2340
2377
2341
Sky file = Jun21_0900_ss.sky
Glare Threshold = 655.30 cd/m² resolution = 500
0 cd/m²
Glare threshold = 655.30 cd/m²

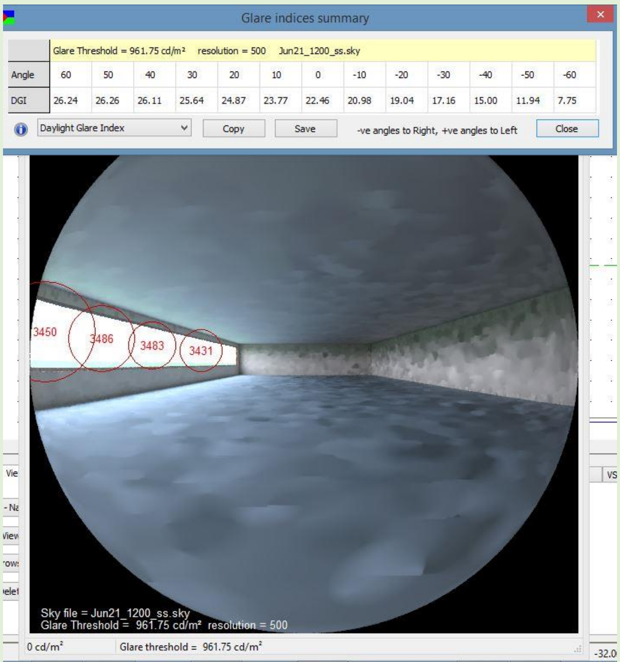
Table 161: Daylight and Glare Analysis for Jun 21, with sunny sky, (N), (P5),(T12).

Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P5) (T12).

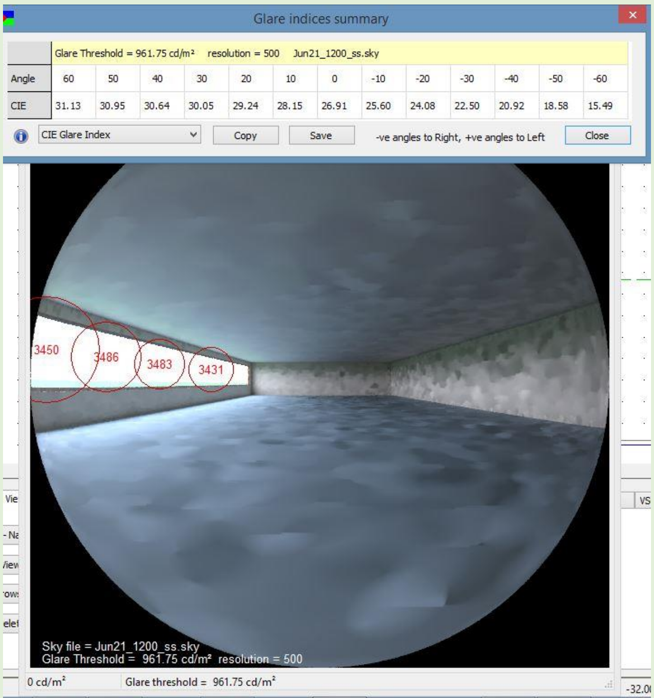
DGP



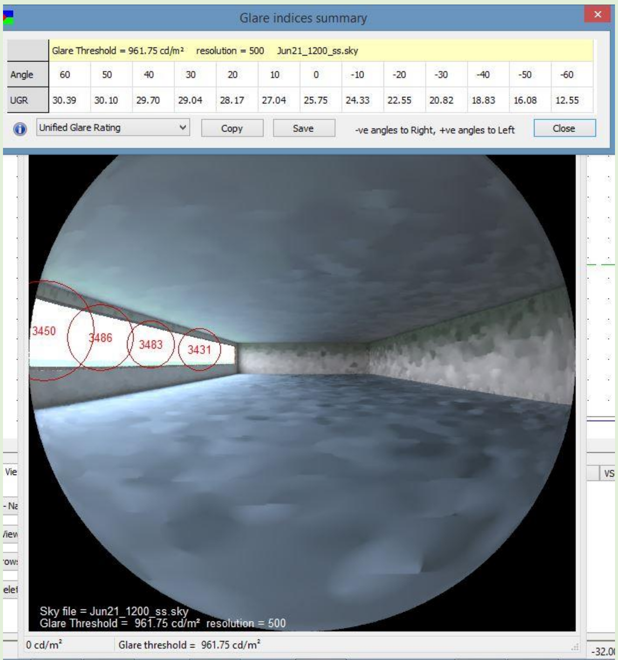
DGI

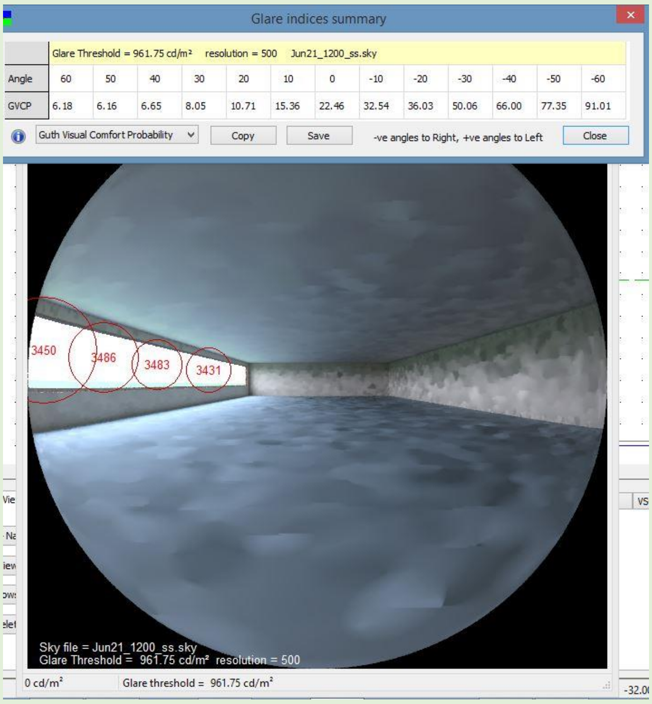
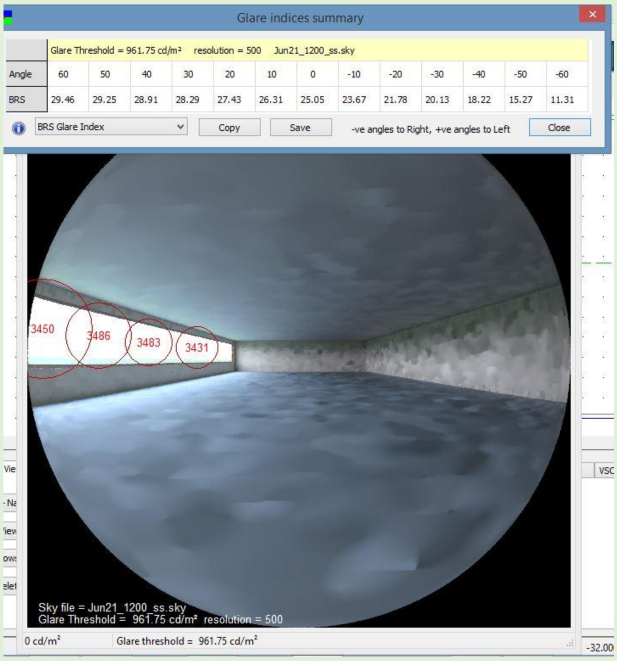


CGI



UGR

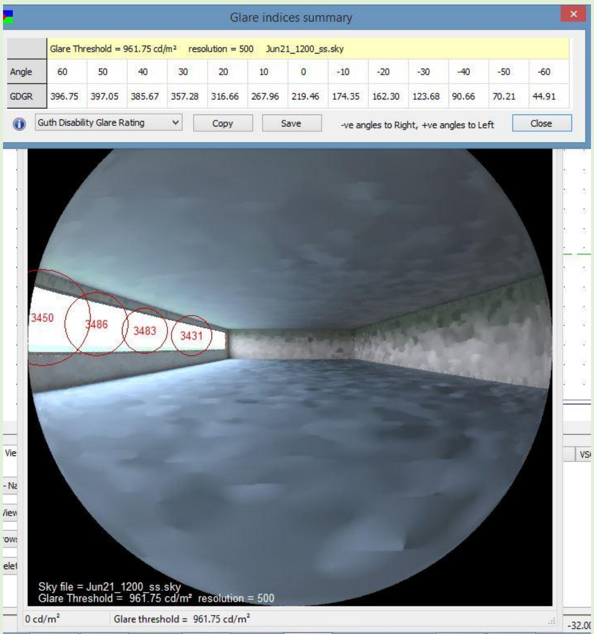


VCP	BRS
	

Glare indices summary
Glare Threshold = 961.75 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 6.18 6.16 6.65 8.05 10.71 15.36 22.46 32.54 36.03 50.06 66.00 77.35 91.01
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3450
3486
3483
3431
Sky file = Jun21_1200_ss.sky
Glare Threshold = 961.75 cd/m² resolution = 500
0 cd/m²
Glare threshold = 961.75 cd/m²

Glare indices summary
Glare Threshold = 961.75 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 29.46 29.25 28.91 28.29 27.43 26.31 25.05 23.67 21.78 20.13 18.22 15.27 11.31
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3450
3486
3483
3431
Sky file = Jun21_1200_ss.sky
Glare Threshold = 961.75 cd/m² resolution = 500
0 cd/m²
Glare threshold = 961.75 cd/m²

GDGR

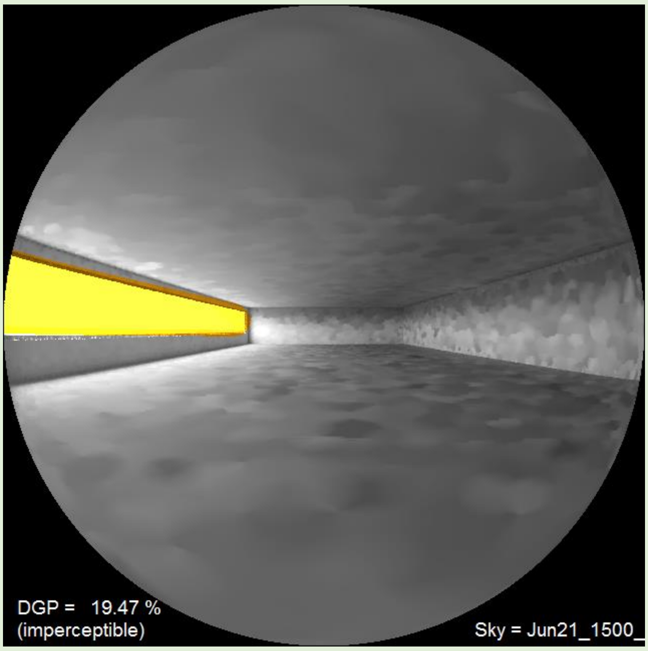


Glare indices summary
Glare Threshold = 961.75 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 396.75 397.05 385.67 357.28 316.66 267.96 219.46 174.35 162.30 123.68 90.66 70.21 44.91
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3450
3486
3483
3431
Sky file = Jun21_1200_ss.sky
Glare Threshold = 961.75 cd/m² resolution = 500
0 cd/m²
Glare threshold = 961.75 cd/m²

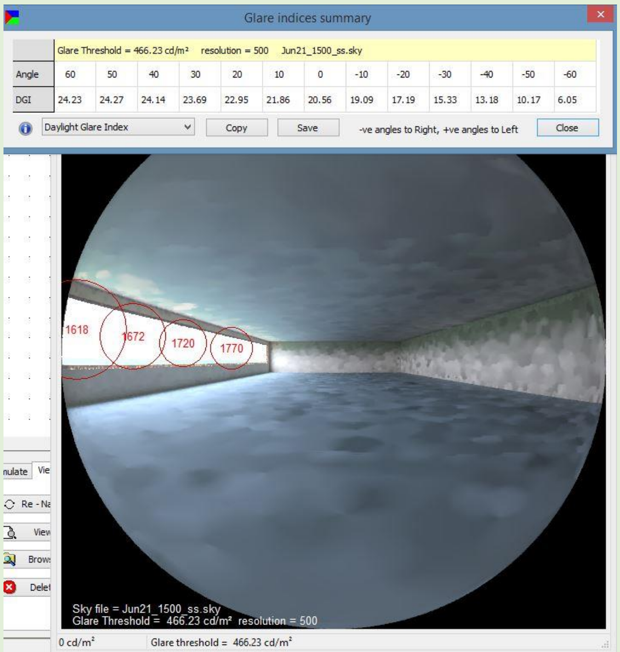
Table 162: Daylight and Glare Analysis for Jun 21, with sunny sky, (N), (P5),(T15).

Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P5) (T15).

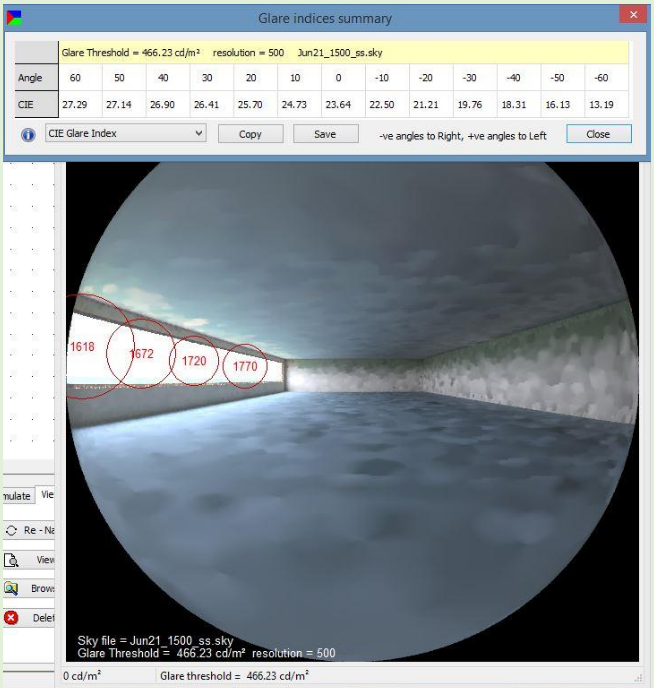
DGP



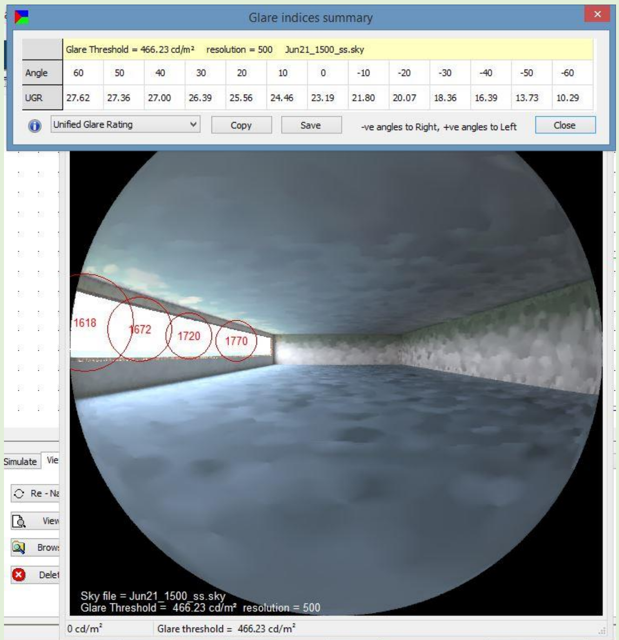
DGI



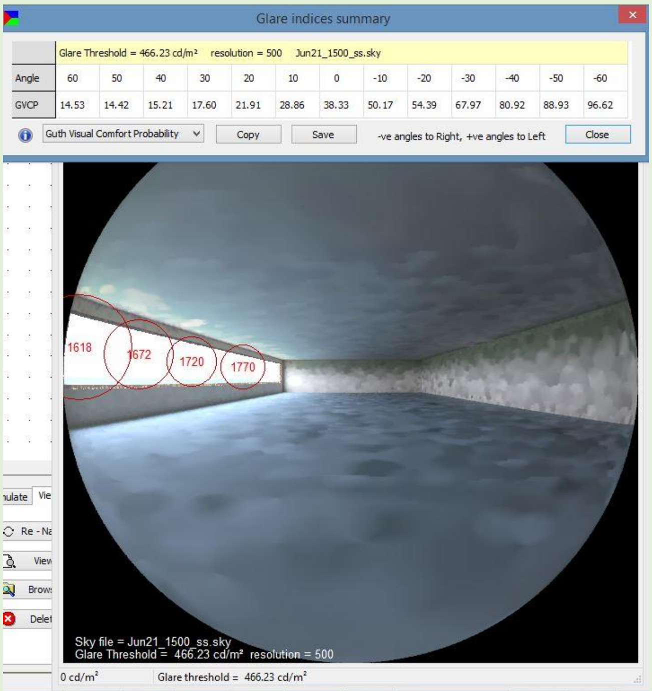
CGI



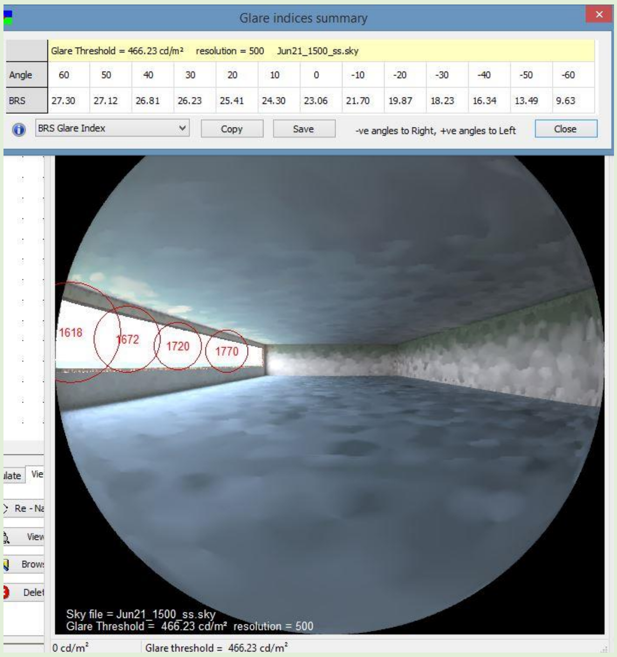
UGR



VCP


Glare indices summary
Glare Threshold = 466.23 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 14.53 14.42 15.21 17.60 21.91 28.86 38.33 50.17 54.39 67.97 80.92 88.93 96.62
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1618
1672
1720
1770
Sky file = Jun21_1500_ss.sky
Glare Threshold = 466.23 cd/m² resolution = 500
0 cd/m²
Glare threshold = 466.23 cd/m²

BRS


Glare indices summary
Glare Threshold = 466.23 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 27.30 27.12 26.81 26.23 25.41 24.30 23.06 21.70 19.87 18.23 16.34 13.49 9.63
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1618
1672
1720
1770
Sky file = Jun21_1500_ss.sky
Glare Threshold = 466.23 cd/m² resolution = 500
0 cd/m²
Glare threshold = 466.23 cd/m²

GDGR

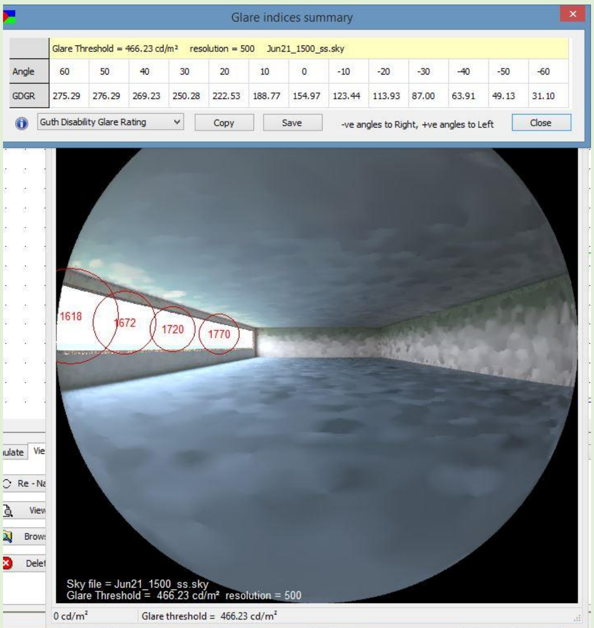
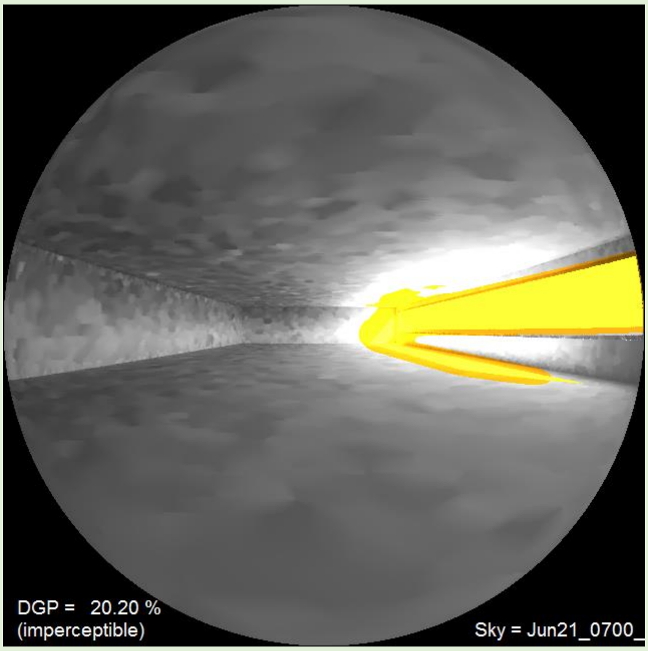

Glare indices summary
Glare Threshold = 466.23 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 275.29 276.29 269.23 250.28 222.53 188.77 154.97 123.44 113.93 87.00 63.91 49.13 31.10
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1618
1672
1720
1770
Sky file = Jun21_1500_ss.sky
Glare Threshold = 466.23 cd/m² resolution = 500
0 cd/m²
Glare threshold = 466.23 cd/m²

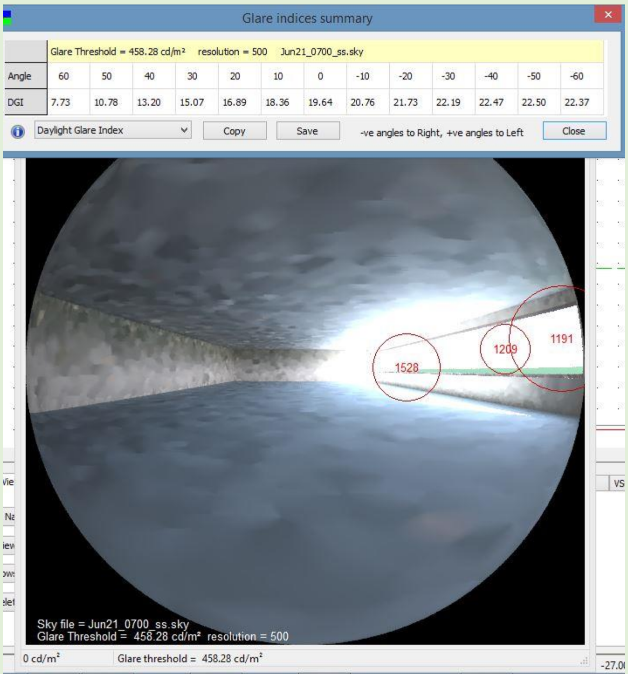
Table 163: Daylight and Glare Analysis for Jun 21, with sunny sky, (N), (P6),(T7).

Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P6) (T7).

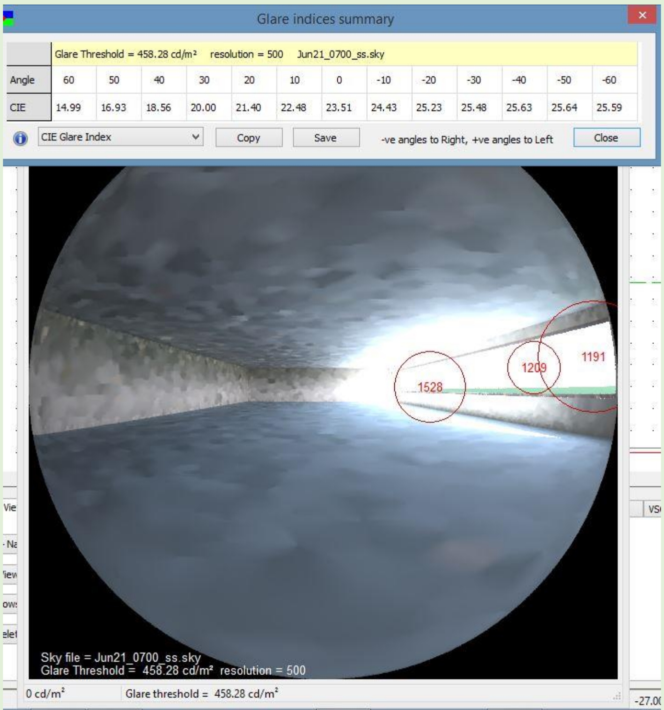
DGP



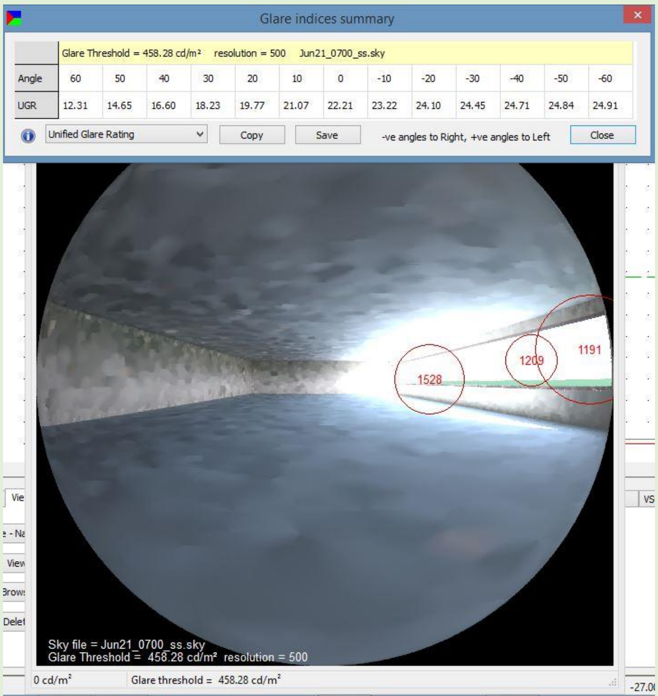
DGI

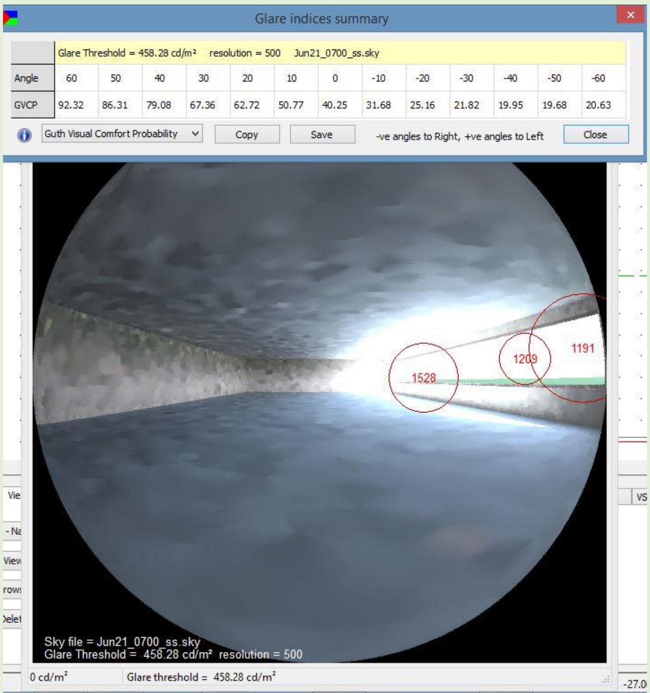
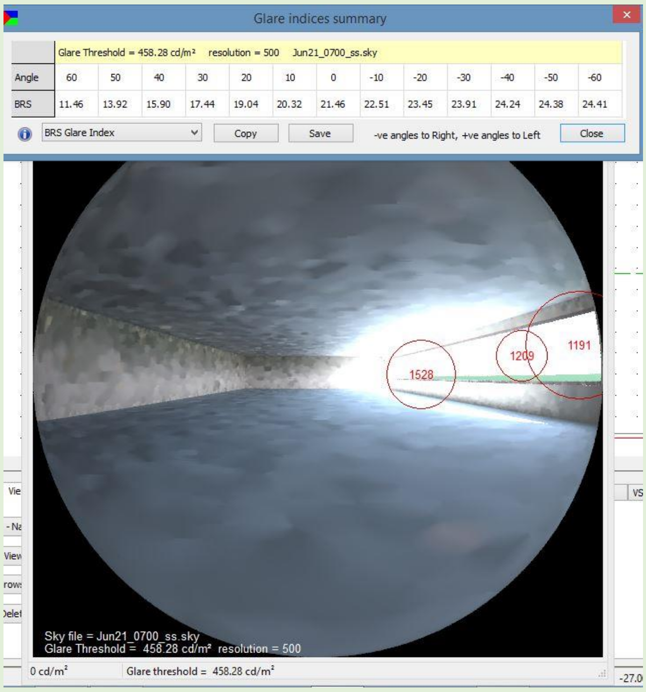


CGI



UGR

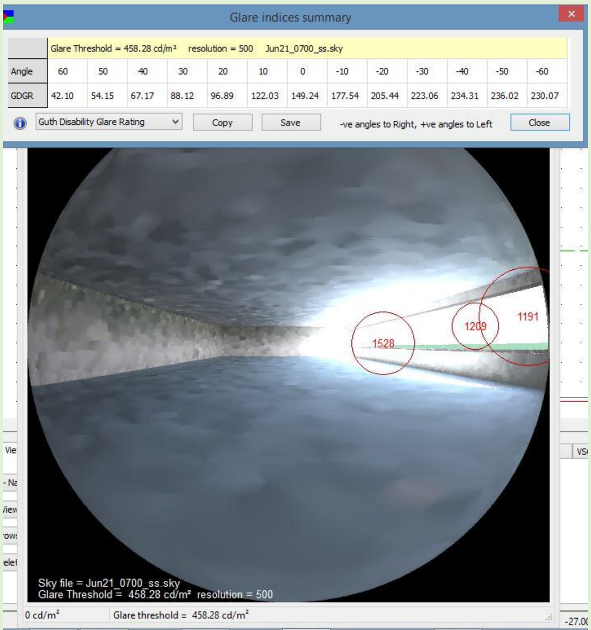


VCP	BRS
	

Glare indices summary
Glare Threshold = 458.28 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 92.32 86.31 79.08 67.36 62.72 50.77 40.25 31.68 25.16 21.82 19.95 19.68 20.63
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1528
1209
1191
Sky file = Jun21_0700_ss.sky
Glare Threshold = 458.28 cd/m² resolution = 500
0 cd/m²
Glare threshold = 458.28 cd/m²

Glare indices summary
Glare Threshold = 458.28 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 11.46 13.92 15.90 17.44 19.04 20.32 21.46 22.51 23.45 23.91 24.24 24.38 24.41
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1528
1209
1191
Sky file = Jun21_0700_ss.sky
Glare Threshold = 458.28 cd/m² resolution = 500
0 cd/m²
Glare threshold = 458.28 cd/m²

GDGR

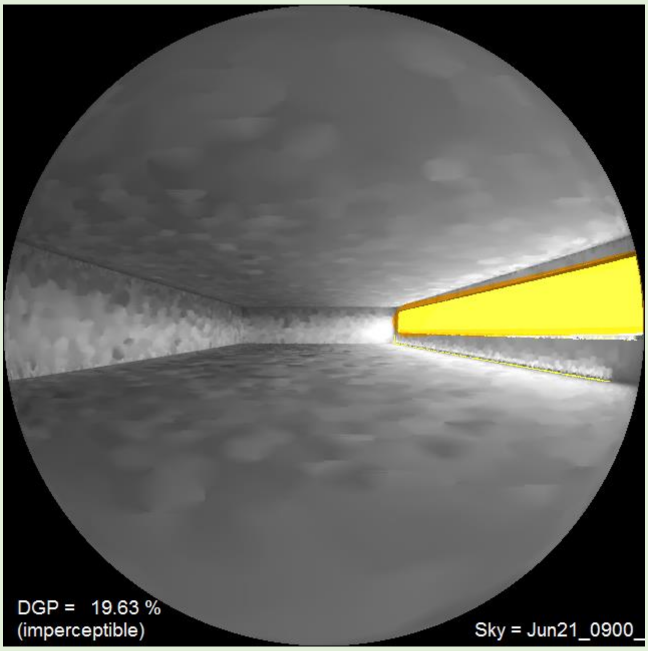


Glare indices summary
Glare Threshold = 458.28 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 42.10 54.15 67.17 88.12 96.89 122.03 149.24 177.54 205.44 223.06 234.31 236.02 230.07
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1528
1209
1191
Sky file = Jun21_0700_ss.sky
Glare Threshold = 458.28 cd/m² resolution = 500
0 cd/m²
Glare threshold = 458.28 cd/m²

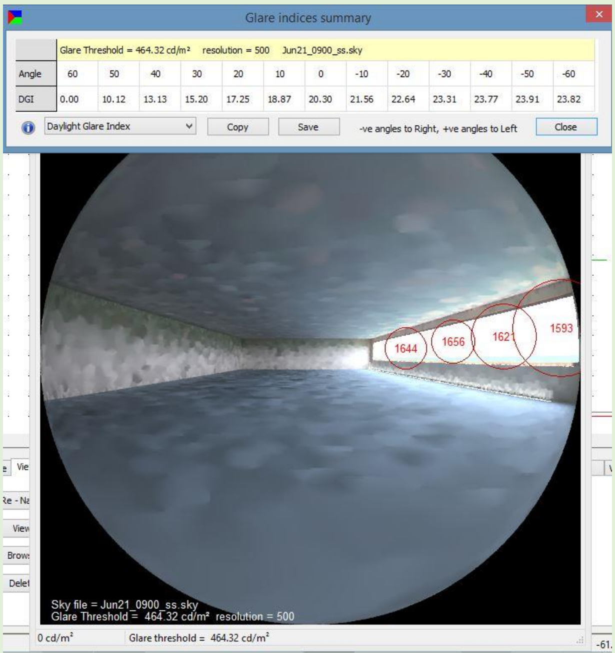
Table 164: Daylight and Glare Analysis for Jun 21, with sunny sky, (N), (P6),(T9).

Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P6) (T9).

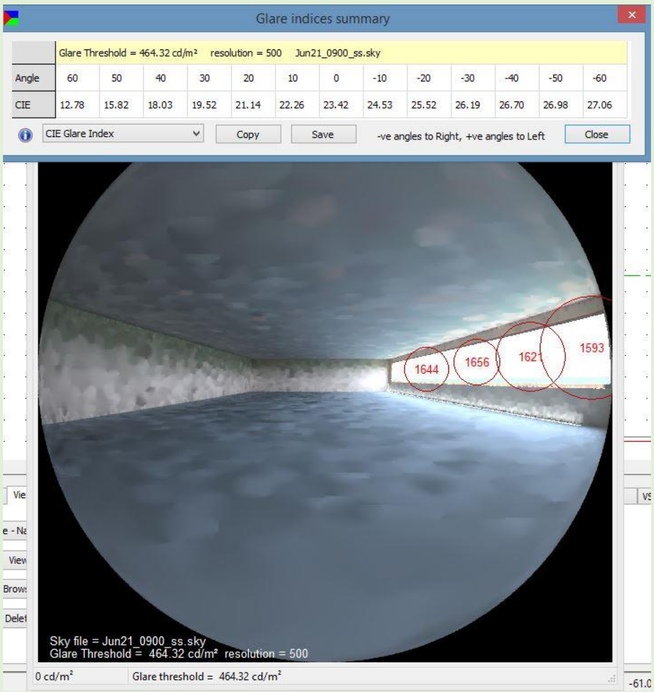
DGP



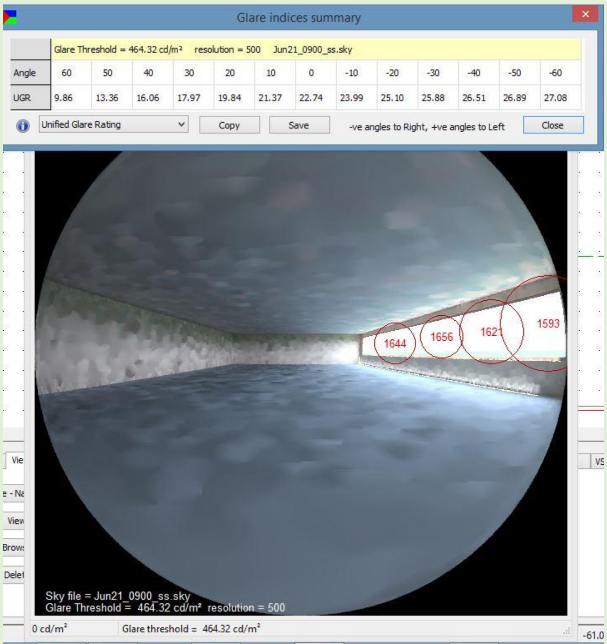
DGI



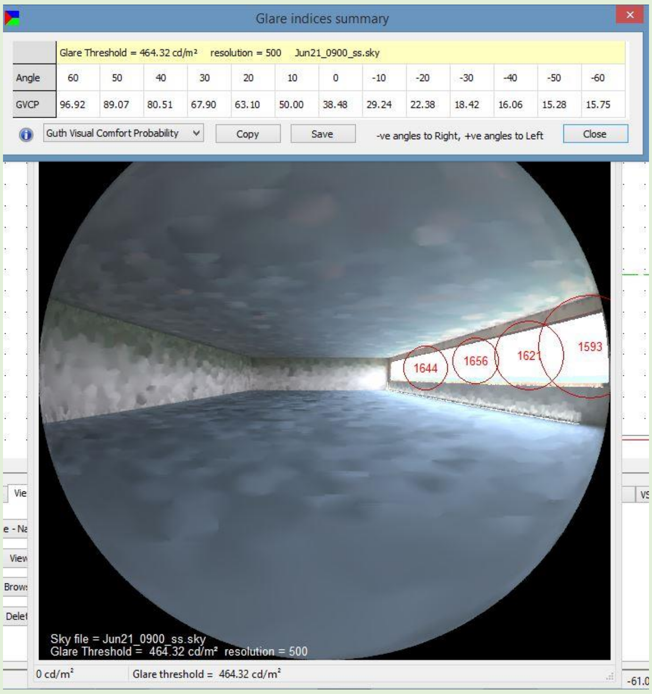
CGI



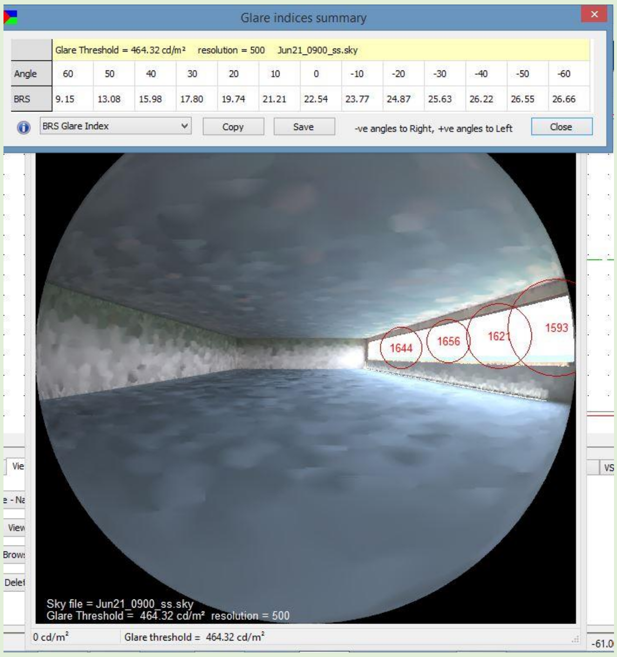
UGR



VCP


Glare indices summary
Glare Threshold = 464.32 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 96.92 89.07 80.51 67.90 63.10 50.00 38.48 29.24 22.38 18.42 16.06 15.28 15.75
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1644
1656
1593
Sky file = Jun21_0900_ss.sky
Glare Threshold = 464.32 cd/m² resolution = 500
0 cd/m²
Glare threshold = 464.32 cd/m²

BRS


Glare indices summary
Glare Threshold = 464.32 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 9.15 13.08 15.98 17.80 19.74 21.21 22.54 23.77 24.87 25.63 26.22 26.55 26.66
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1644
1656
1593
Sky file = Jun21_0900_ss.sky
Glare Threshold = 464.32 cd/m² resolution = 500
0 cd/m²
Glare threshold = 464.32 cd/m²

GDGR

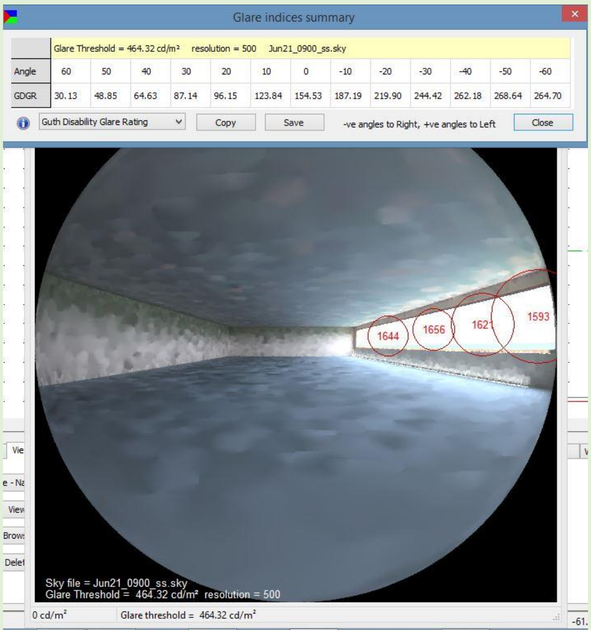
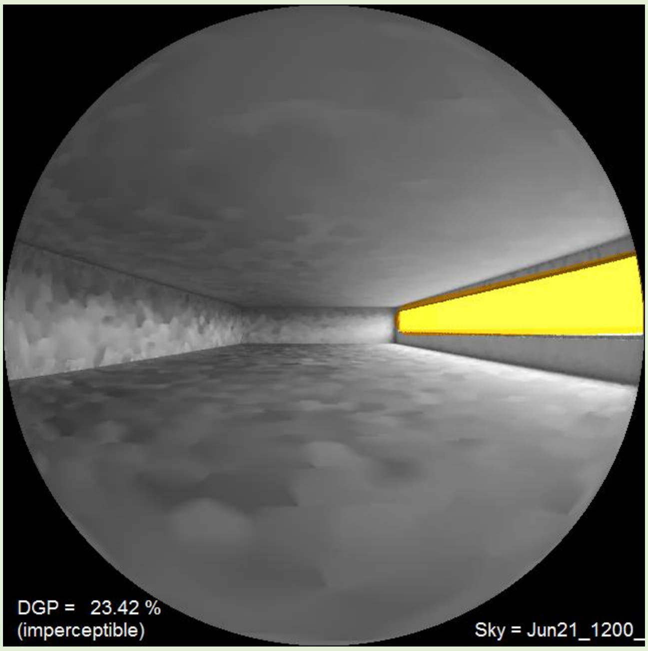

Glare indices summary
Glare Threshold = 464.32 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 30.13 48.85 64.63 87.14 96.15 123.84 154.53 187.19 219.90 244.42 262.18 268.64 264.70
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1644
1656
1593
Sky file = Jun21_0900_ss.sky
Glare Threshold = 464.32 cd/m² resolution = 500
0 cd/m²
Glare threshold = 464.32 cd/m²

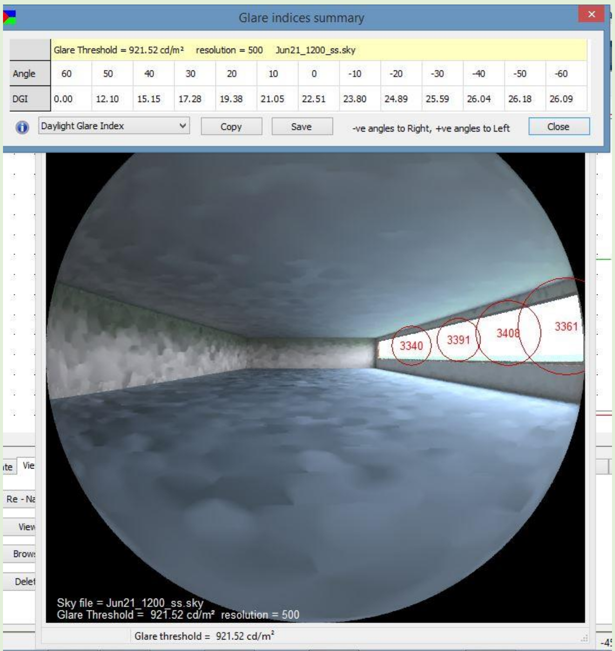
Table 165: Daylight and Glare Analysis for Jun 21, with sunny sky, (N), (P6),(T12).

Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P6) (T12).

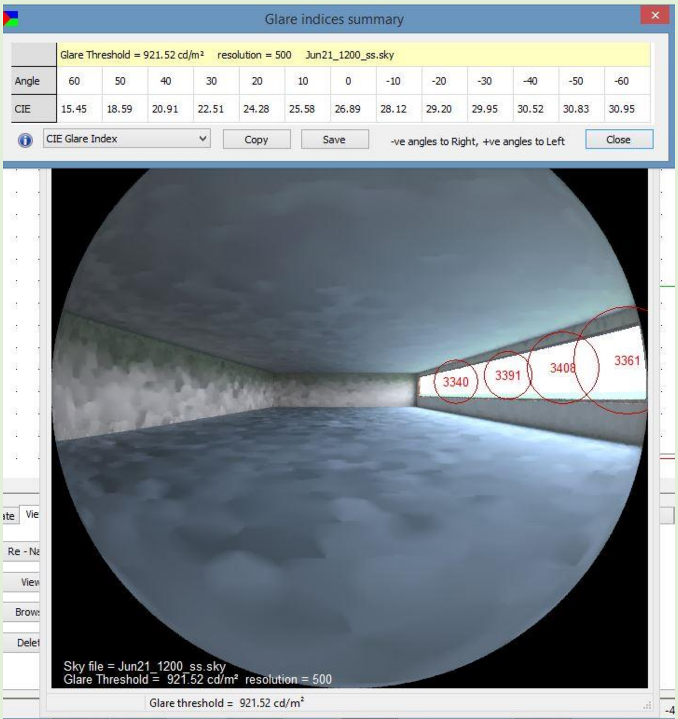
DGP



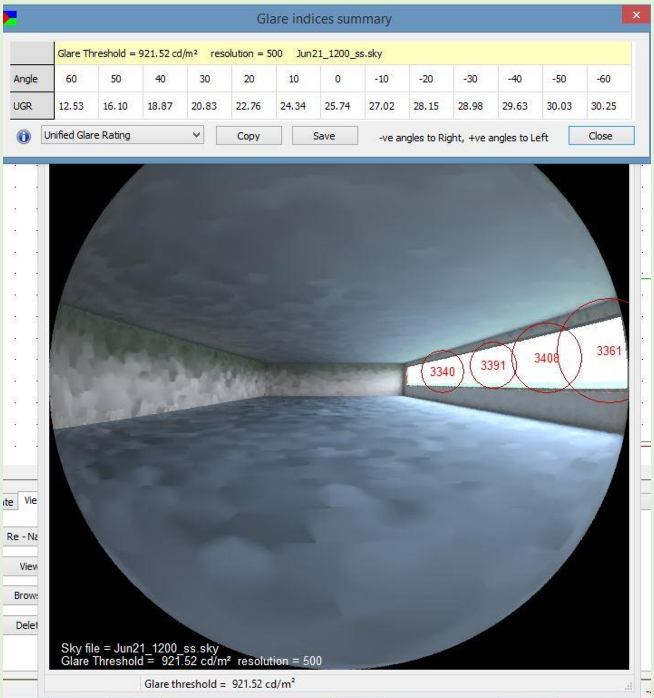
DGI



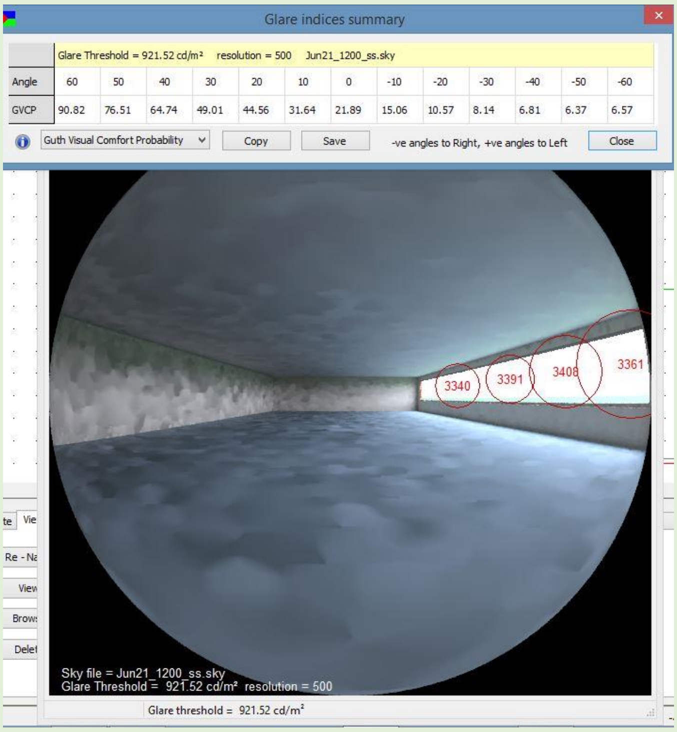
CGI



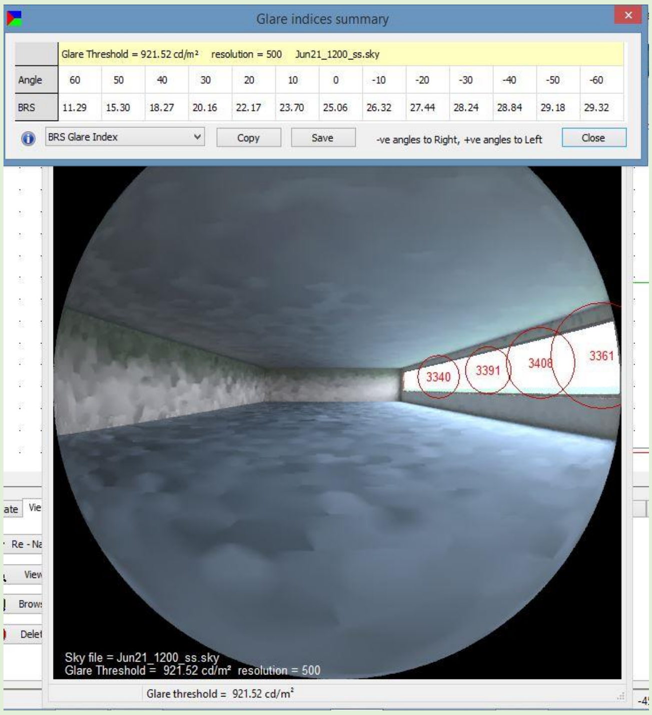
UGR



VCP


Glare indices summary
Glare Threshold = 921.52 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 90.82 76.51 64.74 49.01 44.56 31.64 21.89 15.06 10.57 8.14 6.81 6.37 6.57
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3340
3391
3408
3361
Sky file = Jun21_1200_ss.sky
Glare Threshold = 921.52 cd/m² resolution = 500
Glare threshold = 921.52 cd/m²

BRS


Glare indices summary
Glare Threshold = 921.52 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 11.29 15.30 18.27 20.16 22.17 23.70 25.06 26.32 27.44 28.24 28.84 29.18 29.32
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3340
3391
3408
3361
Sky file = Jun21_1200_ss.sky
Glare Threshold = 921.52 cd/m² resolution = 500
Glare threshold = 921.52 cd/m²

GDGR

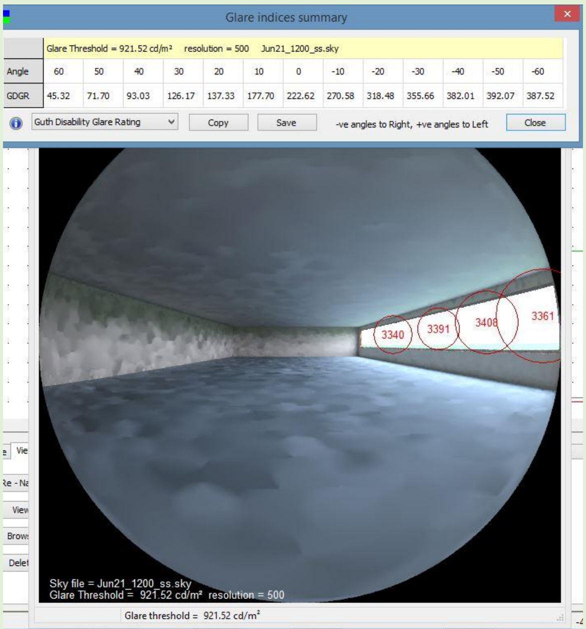
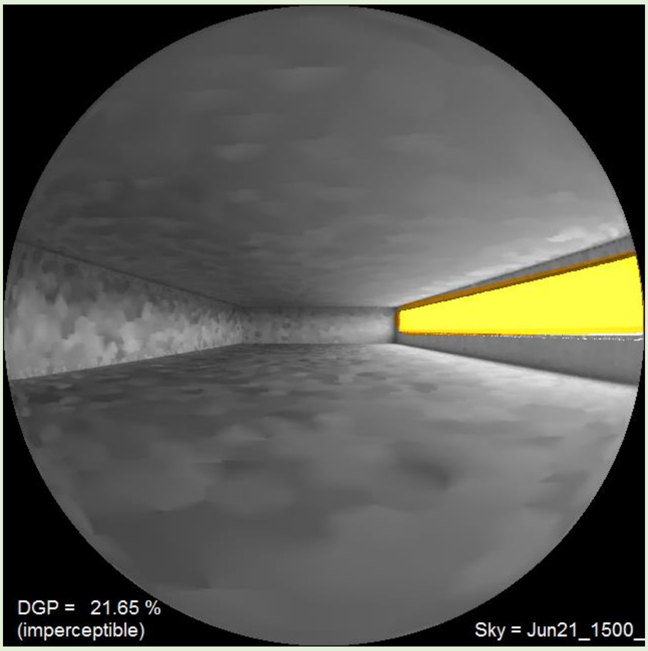

Glare indices summary
Glare Threshold = 921.52 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 45.32 71.70 93.03 126.17 137.33 177.70 222.62 270.58 318.48 355.66 382.01 392.07 387.52
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3340
3391
3408
3361
Sky file = Jun21_1200_ss.sky
Glare Threshold = 921.52 cd/m² resolution = 500
Glare threshold = 921.52 cd/m²

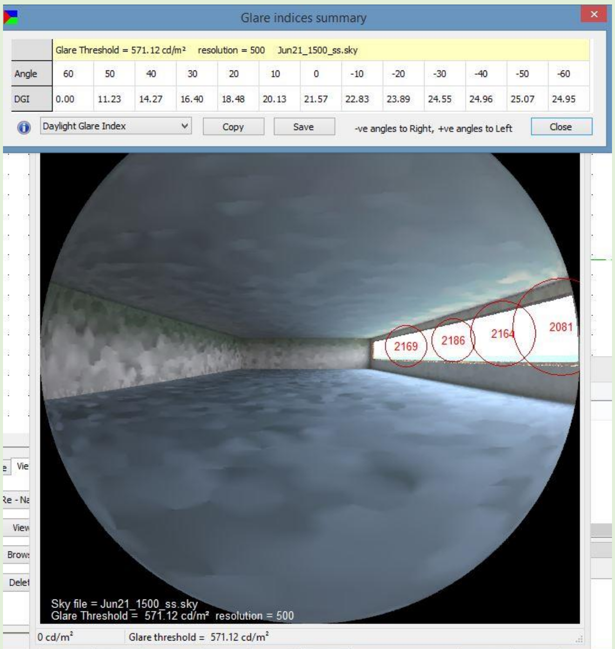
Table 166: Daylight and Glare Analysis for Jun 21, with sunny sky, (N), (P6),(T15).

Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P6) (T15).

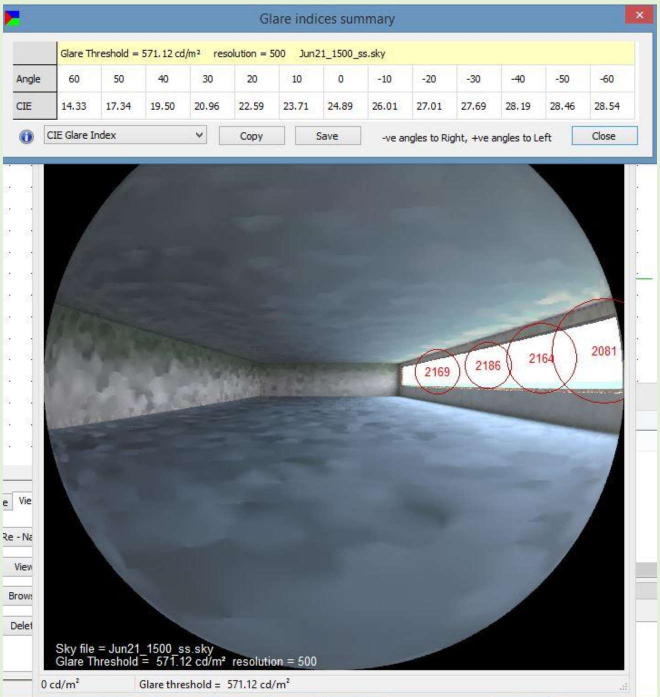
DGP



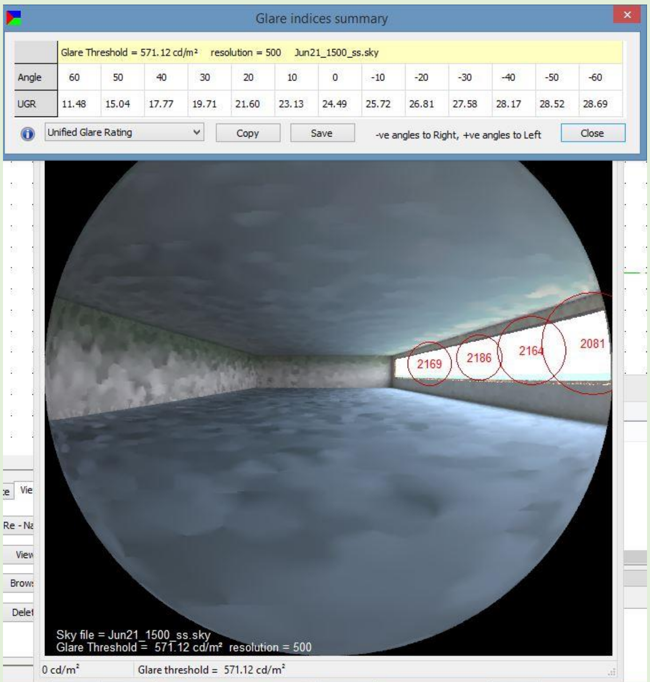
DGI



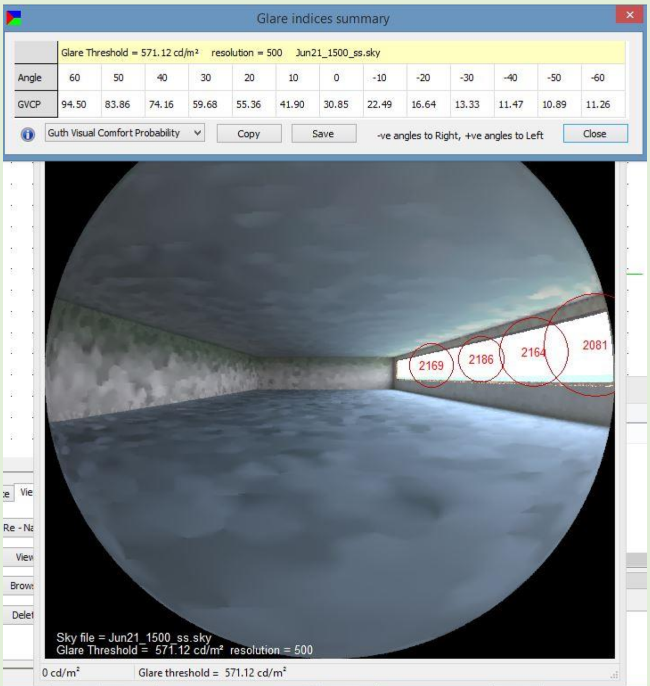
CGI



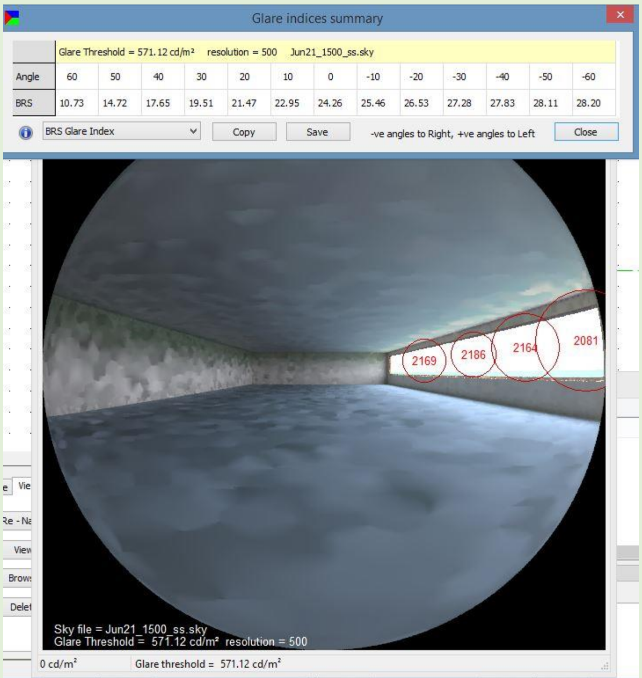
UGR



VCP


Glare indices summary
Glare Threshold = 571.12 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 94.50 83.86 74.16 59.68 55.36 41.90 30.85 22.49 16.64 13.33 11.47 10.89 11.26
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2169
2186
2164
2081
Sky file = Jun21_1500_ss.sky
Glare Threshold = 571.12 cd/m² resolution = 500
0 cd/m²
Glare threshold = 571.12 cd/m²

BRS


Glare indices summary
Glare Threshold = 571.12 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 10.73 14.72 17.65 19.51 21.47 22.95 24.26 25.46 26.53 27.28 27.83 28.11 28.20
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2169
2186
2164
2081
Sky file = Jun21_1500_ss.sky
Glare Threshold = 571.12 cd/m² resolution = 500
0 cd/m²
Glare threshold = 571.12 cd/m²

GDGR

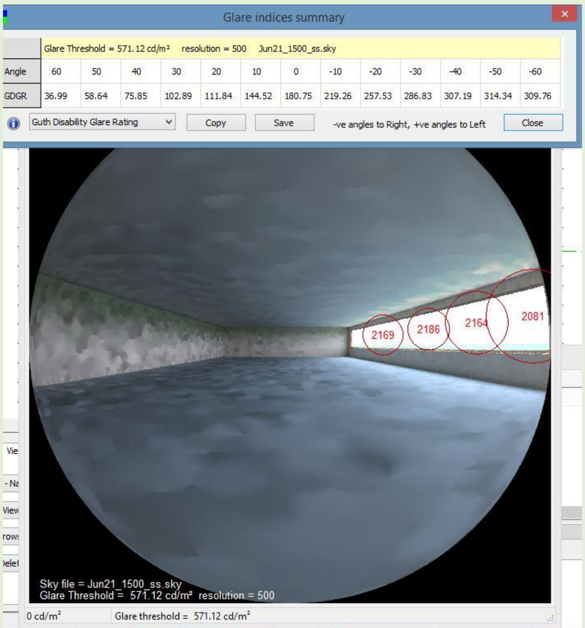
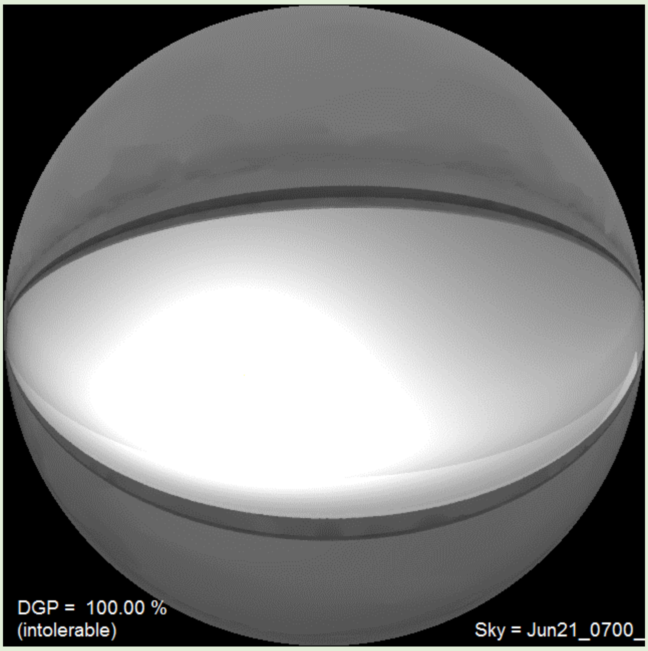
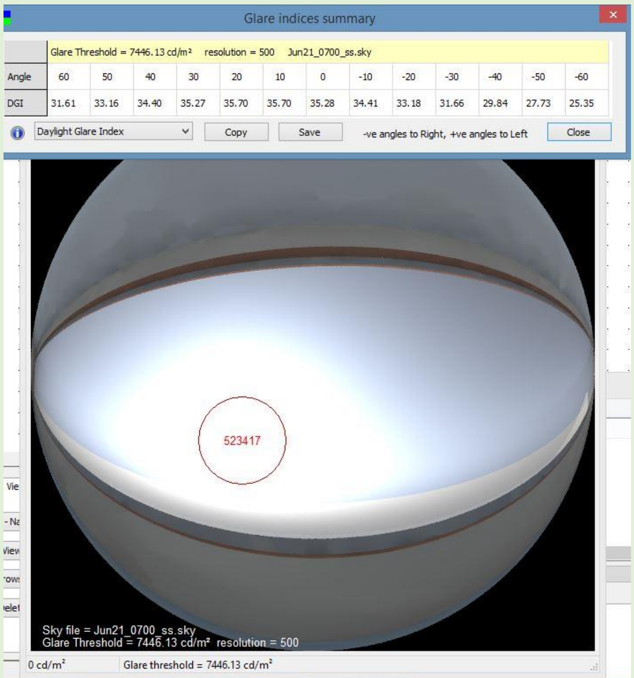
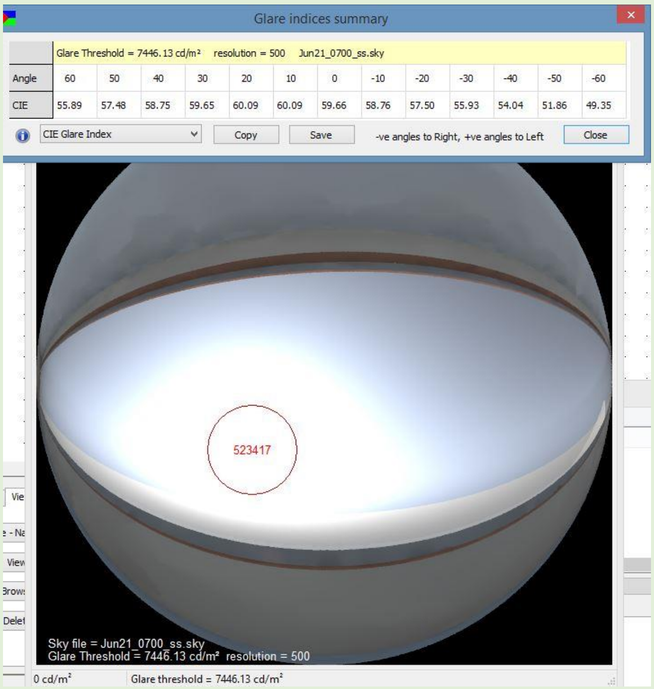
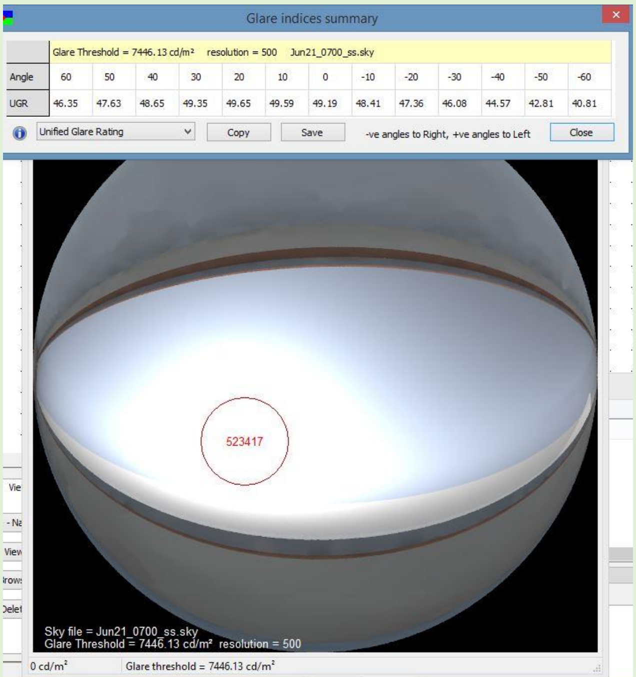

Glare indices summary
Glare Threshold = 571.12 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 36.99 58.64 75.85 102.89 111.84 144.52 180.75 219.26 257.53 286.83 307.19 314.34 309.76
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2169
2186
2164
2081
Sky file = Jun21_1500_ss.sky
Glare Threshold = 571.12 cd/m² resolution = 500
0 cd/m²
Glare threshold = 571.12 cd/m²

Table 167: Daylight and Glare Analysis for Jun 21, with sunny sky, (E), (P4/1.5m),(T7).

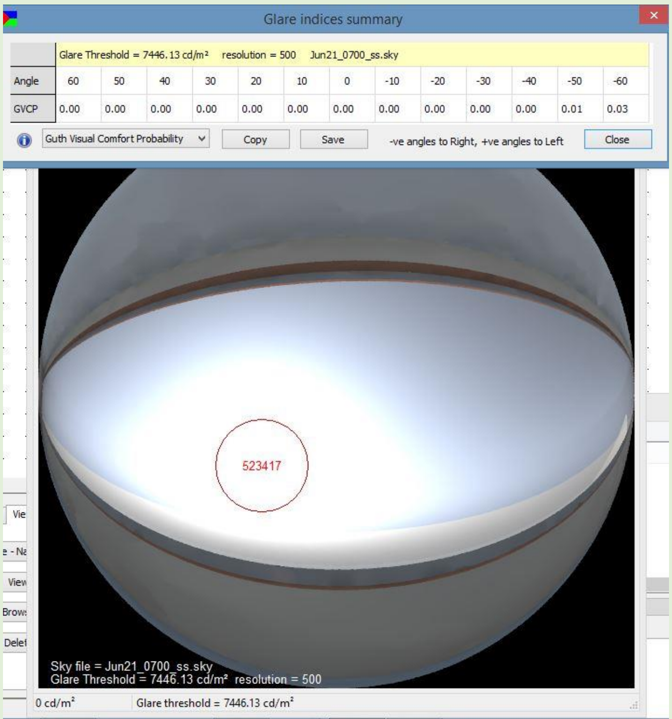
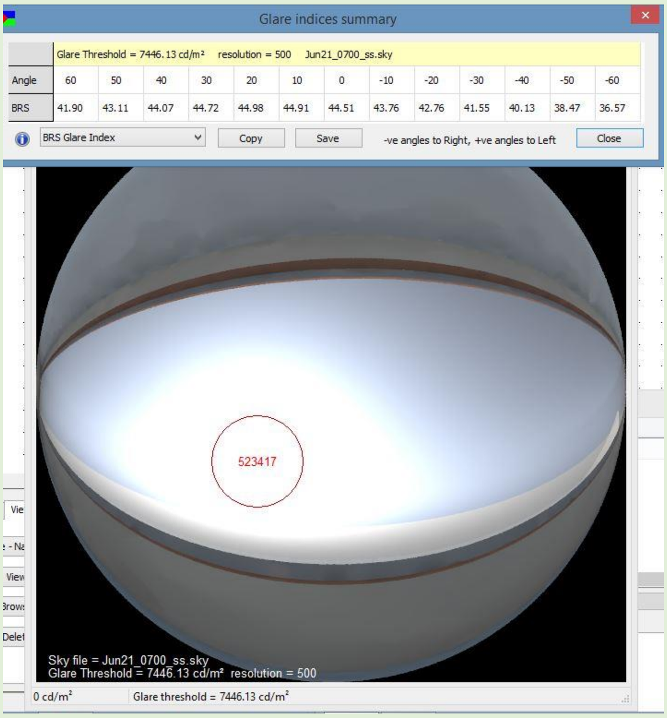
<table>
<tr><th colspan="2">Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P4/1.5m) (T7).</th></tr>
<tr><th>DGP</th><th>DGI</th></tr>
<tr><td>


</td><td>


</td></tr>
<tr><th>CGI</th><th>UGR</th></tr>
<tr><td>


</td><td>


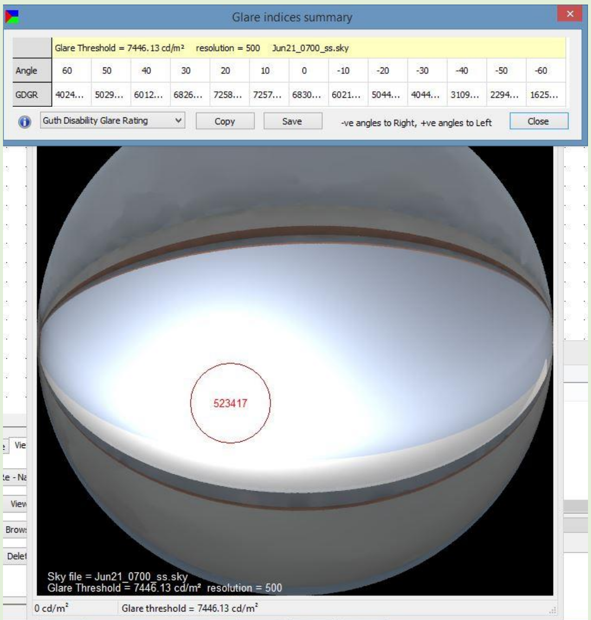
</td></tr>
</table>

VCP	BRS
	

Glare indices summary
Glare Threshold = 7446.13 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.01 0.03
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
523417
Sky file = Jun21_0700_ss.sky
Glare Threshold = 7446.13 cd/m² resolution = 500
0 cd/m²
Glare threshold = 7446.13 cd/m²

Glare indices summary
Glare Threshold = 7446.13 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 41.90 43.11 44.07 44.72 44.98 44.91 44.51 43.76 42.76 41.55 40.13 38.47 36.57
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
523417
Sky file = Jun21_0700_ss.sky
Glare Threshold = 7446.13 cd/m² resolution = 500
0 cd/m²
Glare threshold = 7446.13 cd/m²

GDGR

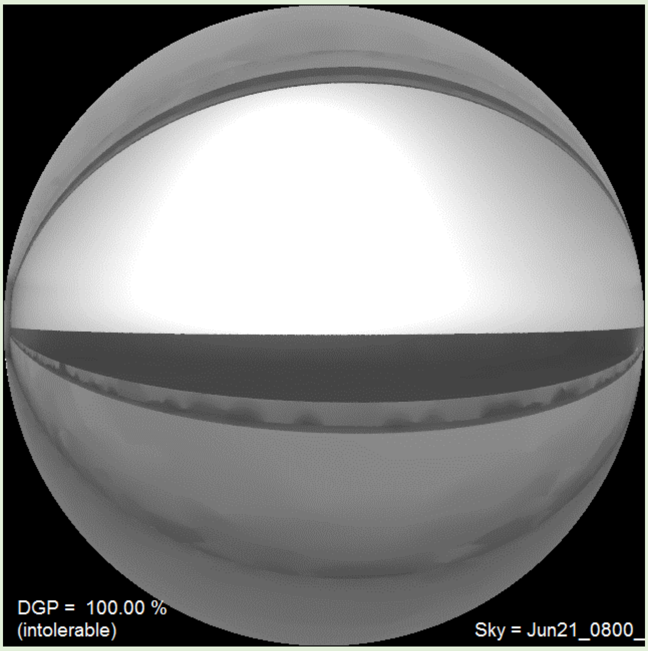


Glare indices summary
Glare Threshold = 7446.13 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 4024... 5029... 6012... 6826... 7258... 7257... 6830... 6021... 5044... 4044... 3109... 2294... 1625...
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
523417
Sky file = Jun21_0700_ss.sky
Glare Threshold = 7446.13 cd/m² resolution = 500
0 cd/m²
Glare threshold = 7446.13 cd/m²

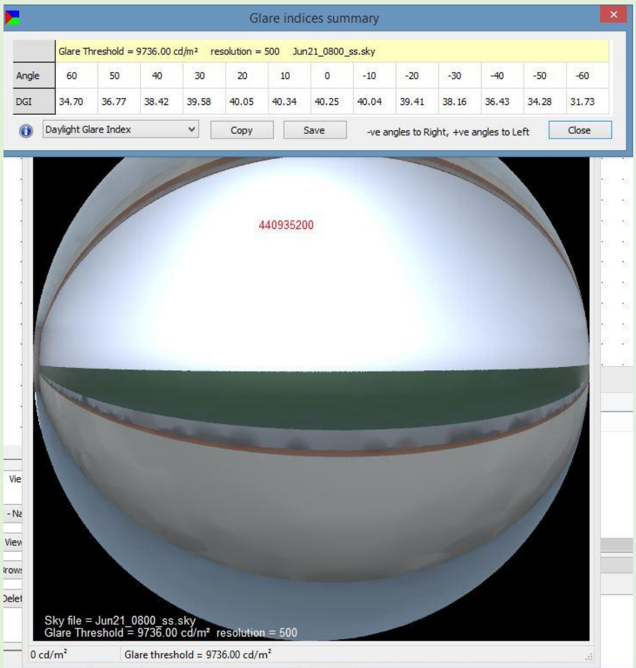
Table 168: Daylight and Glare Analysis for Jun 21, with sunny sky, (E), (P4/1.5m),(T8).

Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P4/1.5m) (T8).

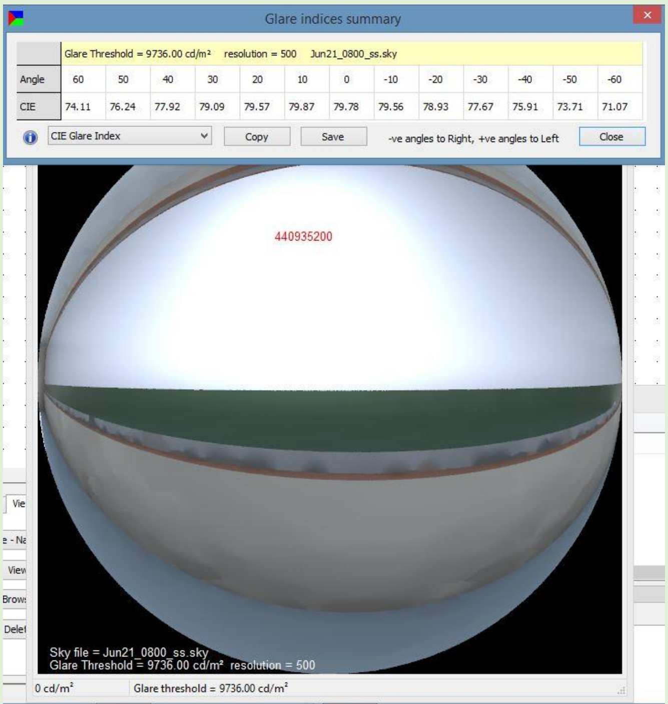
DGP



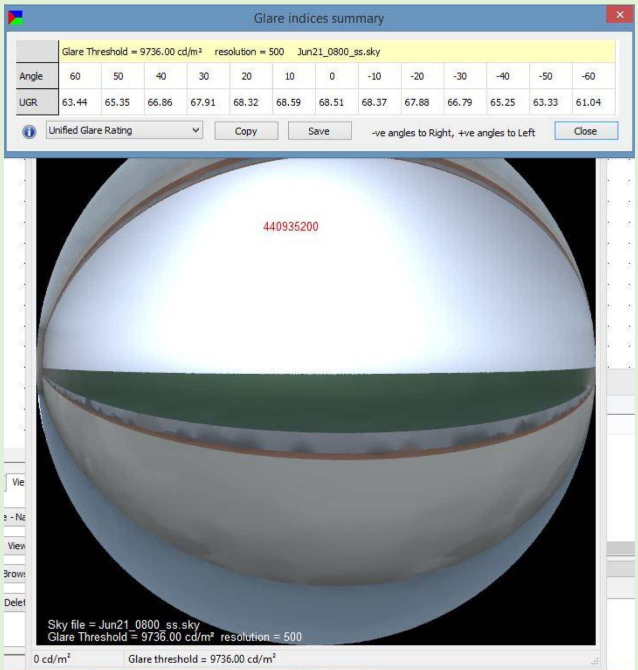
DGI



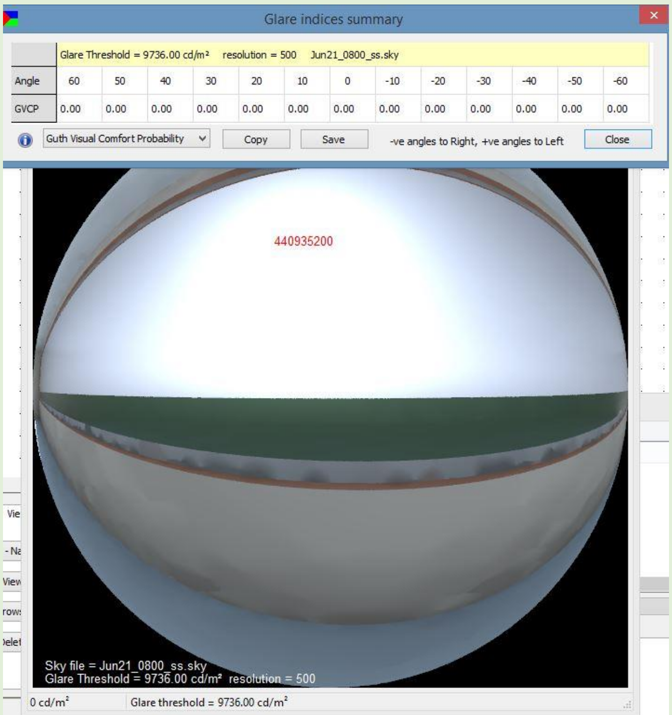
CGI



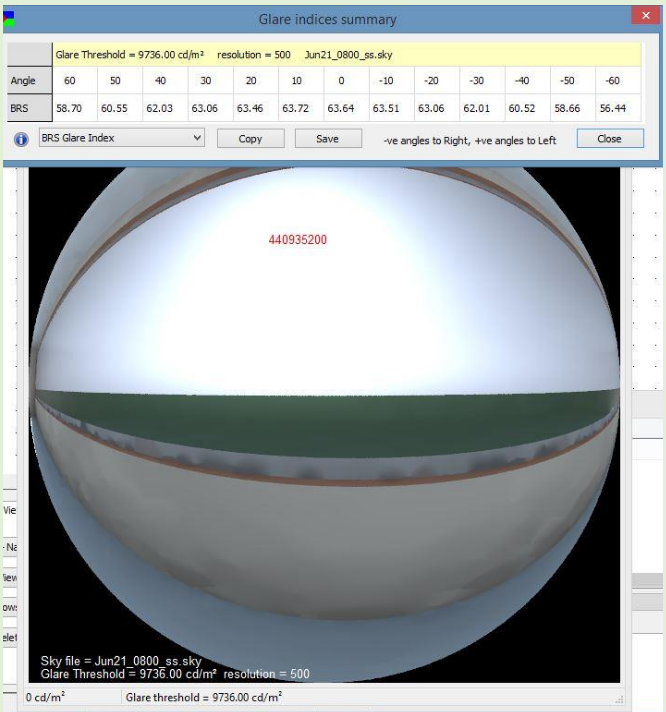
UGR



VCP


Glare indices summary
Glare Threshold = 9736.00 cd/m² resolution = 500 Jun21_0800_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
440935200
Sky file = Jun21_0800_ss.sky
Glare Threshold = 9736.00 cd/m² resolution = 500
0 cd/m²
Glare threshold = 9736.00 cd/m²

BRS


Glare indices summary
Glare Threshold = 9736.00 cd/m² resolution = 500 Jun21_0800_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 58.70 60.55 62.03 63.06 63.46 63.72 63.64 63.51 63.06 62.01 60.52 58.66 56.44
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
440935200
Sky file = Jun21_0800_ss.sky
Glare Threshold = 9736.00 cd/m² resolution = 500
0 cd/m²
Glare threshold = 9736.00 cd/m²

GDGR

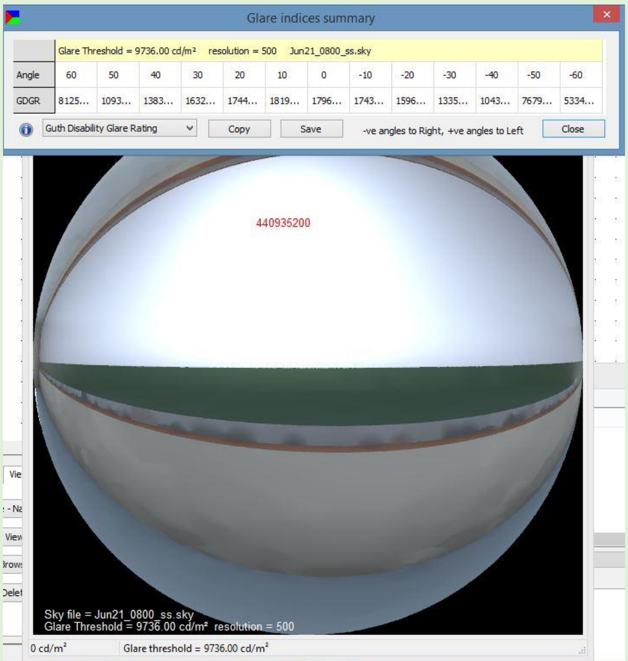
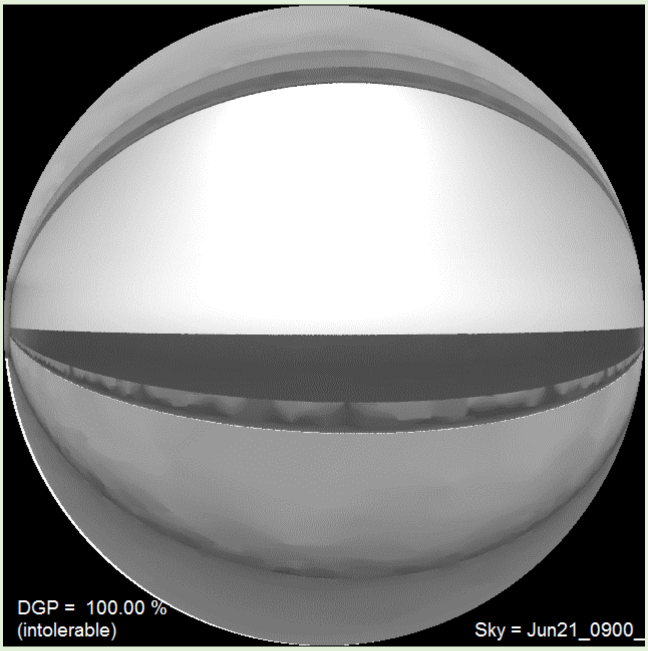

Glare indices summary
Glare Threshold = 9736.00 cd/m² resolution = 500 Jun21_0800_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 8125... 1093... 1383... 1632... 1744... 1819... 1796... 1743... 1596... 1335... 1043... 7679... 5334...
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
440935200
Sky file = Jun21_0800_ss.sky
Glare Threshold = 9736.00 cd/m² resolution = 500
0 cd/m²
Glare threshold = 9736.00 cd/m²

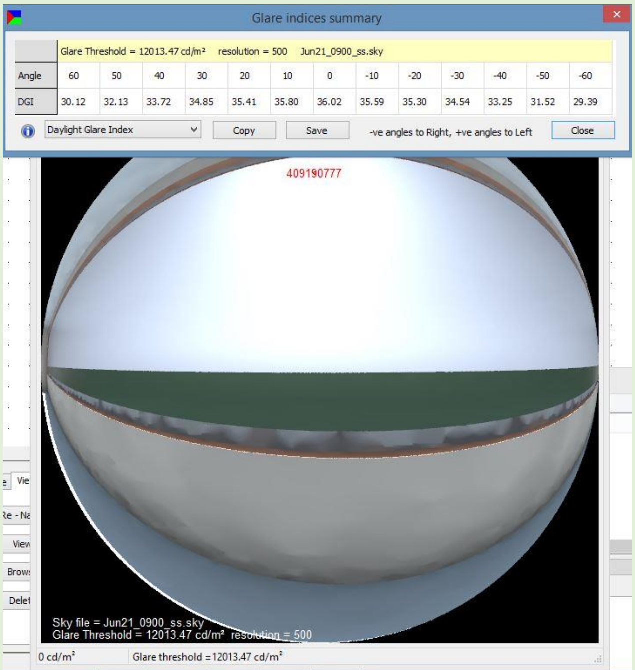
Table 169: Daylight and Glare Analysis for Jun 21, with sunny sky, (E), (P4/1.5m),(T9).

Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P4/1.5m) (T9).

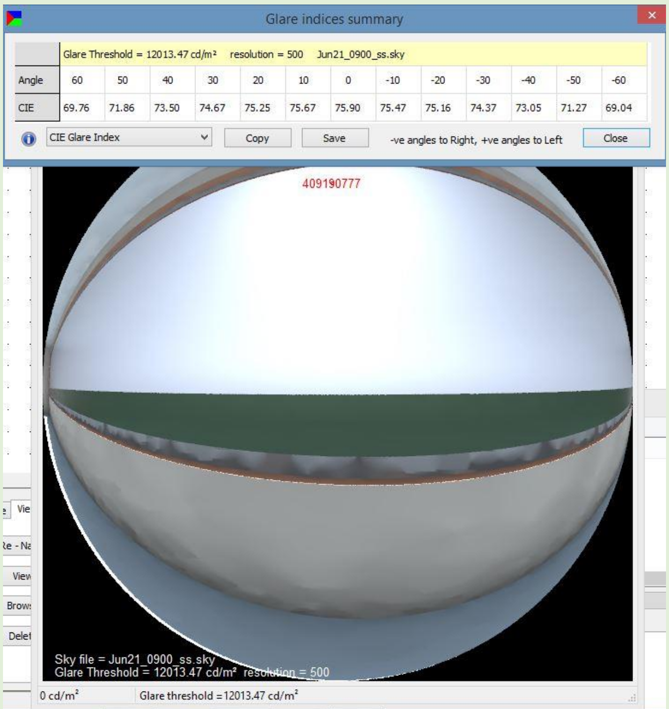
DGP



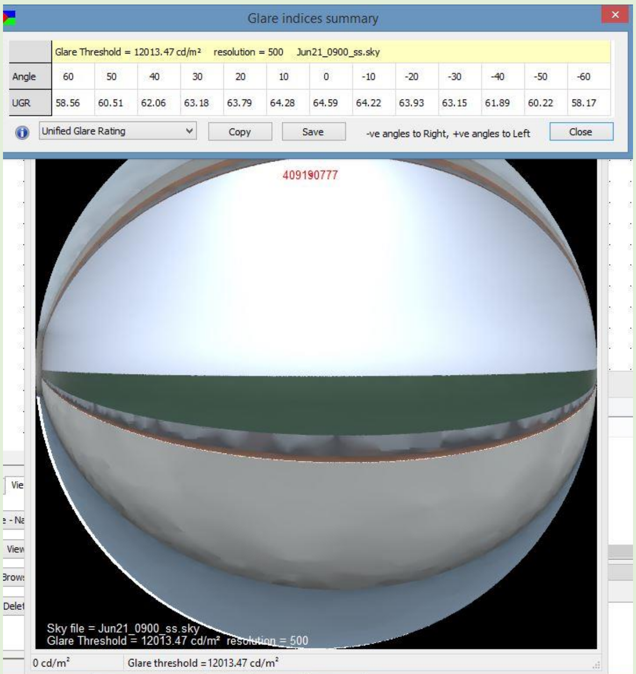
DGI



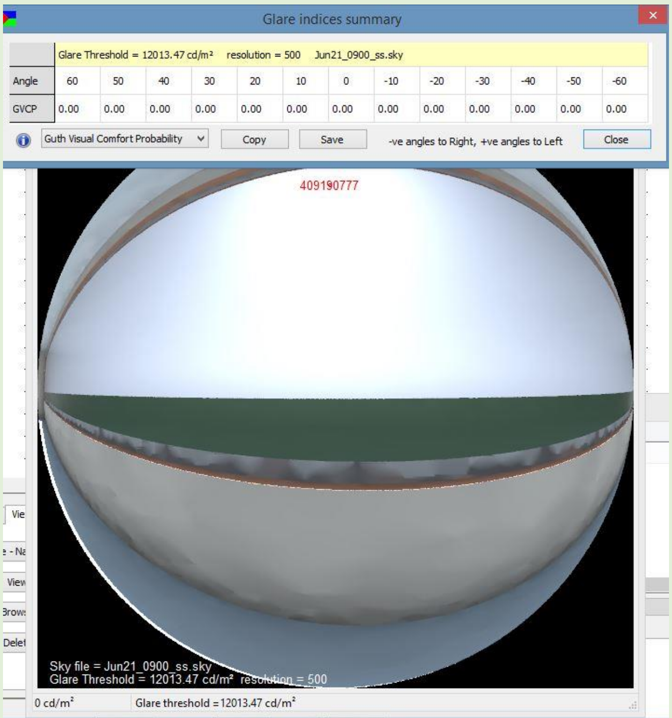
CGI



UGR

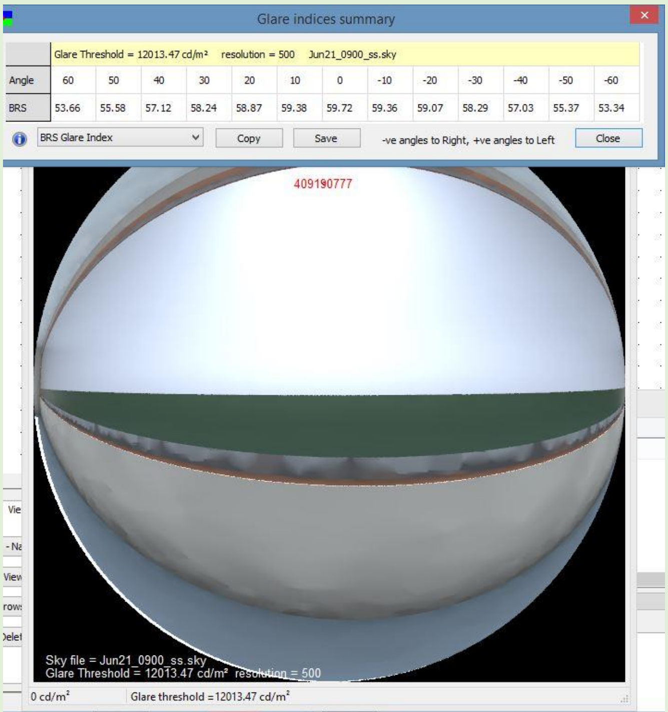


VCP



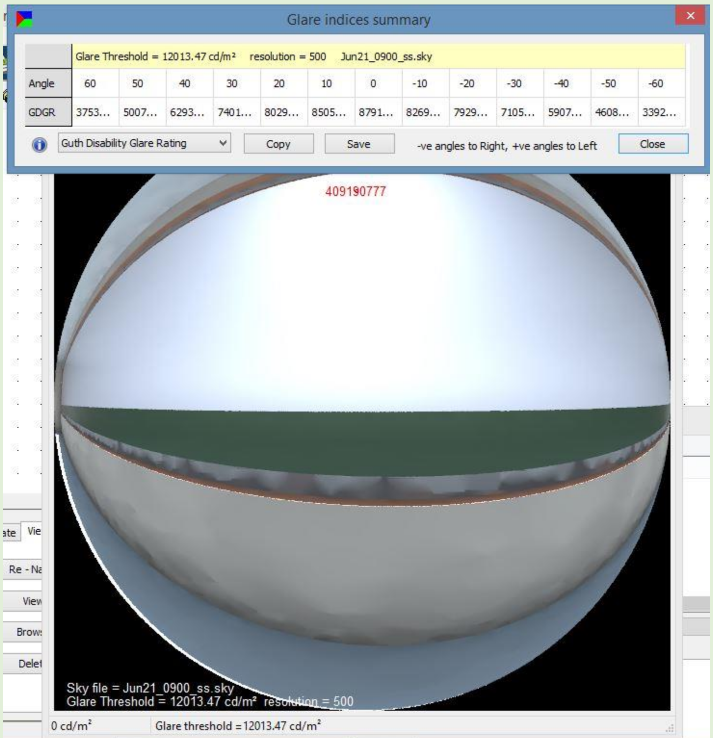
Glare indices summary
Glare Threshold = 12013.47 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
409190777
Sky file = Jun21_0900_ss.sky
Glare Threshold = 12013.47 cd/m² resolution = 500
0 cd/m²
Glare threshold = 12013.47 cd/m²

BRS



Glare indices summary
Glare Threshold = 12013.47 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 53.66 55.58 57.12 58.24 58.87 59.38 59.72 59.36 59.07 58.29 57.03 55.37 53.34
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
409190777
Sky file = Jun21_0900_ss.sky
Glare Threshold = 12013.47 cd/m² resolution = 500
0 cd/m²
Glare threshold = 12013.47 cd/m²

GDGR

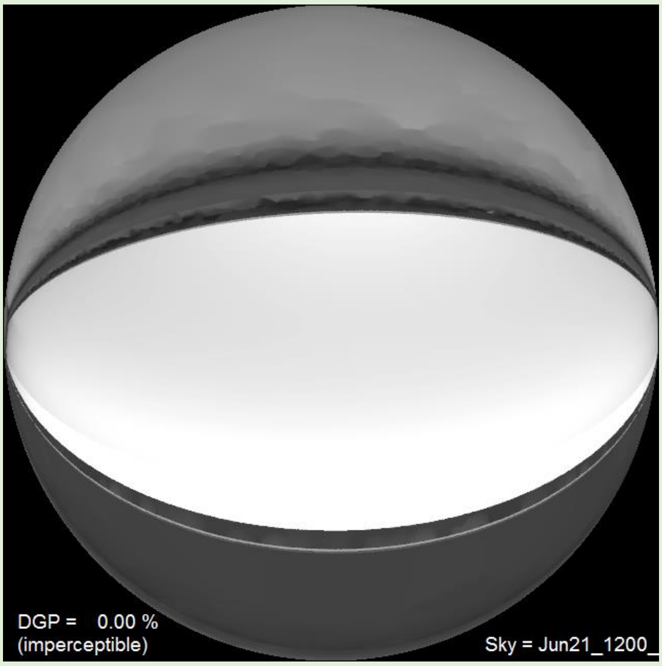


Glare indices summary
Glare Threshold = 12013.47 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 3753... 5007... 6293... 7401... 8029... 8505... 8791... 8269... 7929... 7105... 5907... 4608... 3392...
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
409190777
Sky file = Jun21_0900_ss.sky
Glare Threshold = 12013.47 cd/m² resolution = 500
0 cd/m²
Glare threshold = 12013.47 cd/m²

Table 170: Daylight and Glare Analysis for Jun 21, with sunny sky, (E), (P4/1.5m),(T12).

Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P4/1.5m) (T12).

DGP



VCP

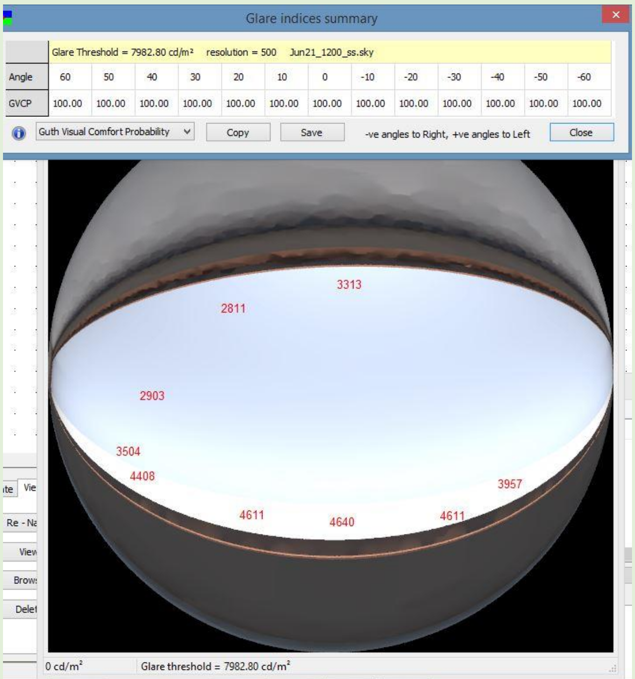
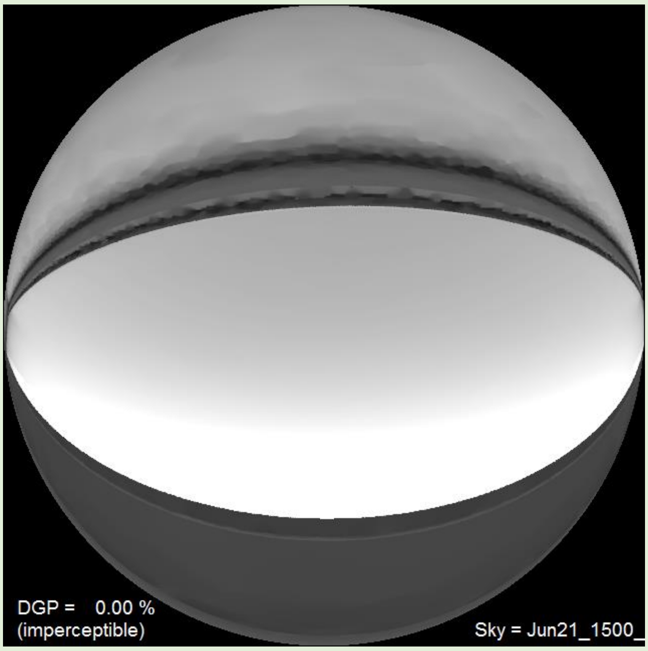


Table 171: Daylight and Glare Analysis for Jun 21, with sunny sky, (E), (P4/1.5m),(T15).

Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P4/1.5m) (T15).

DGP



DGI

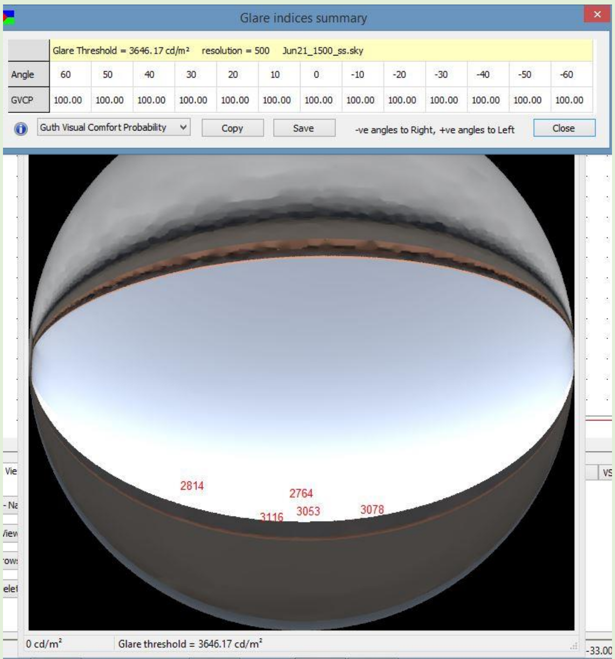
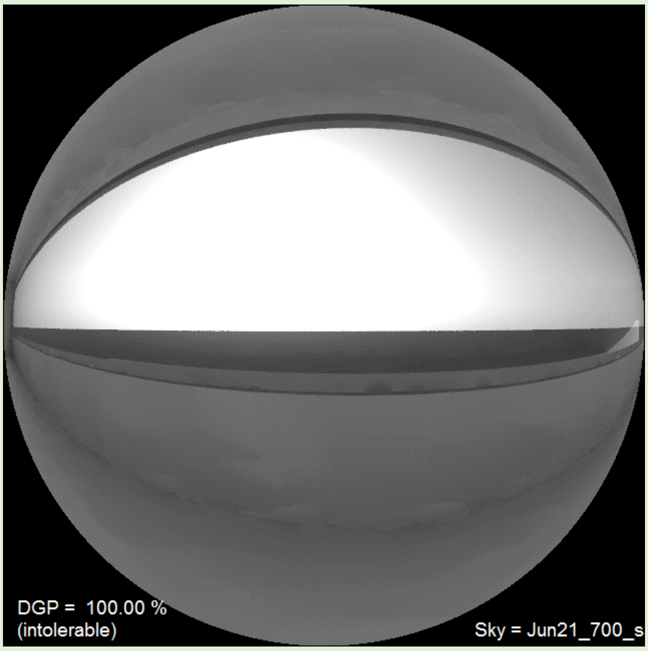


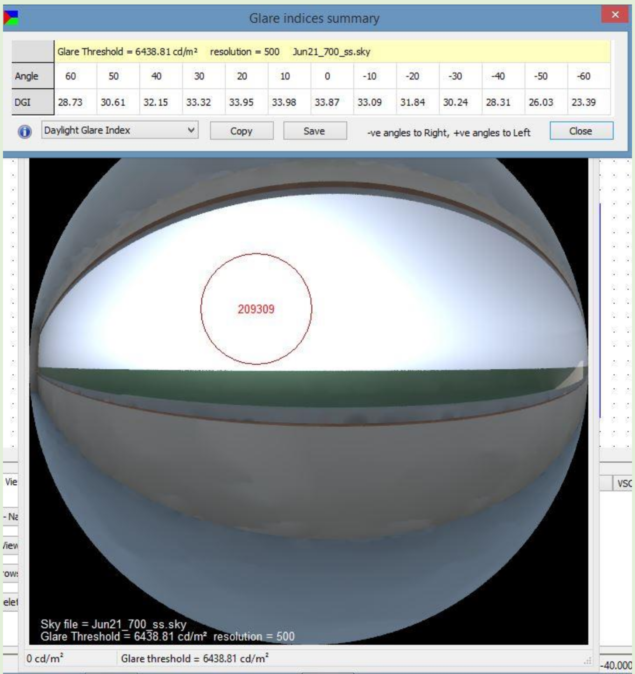
Table 172: Daylight and Glare Analysis for Jun 21, with sunny sky, (E), (P4/2m),(T7).

Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P4/2m) (T7).

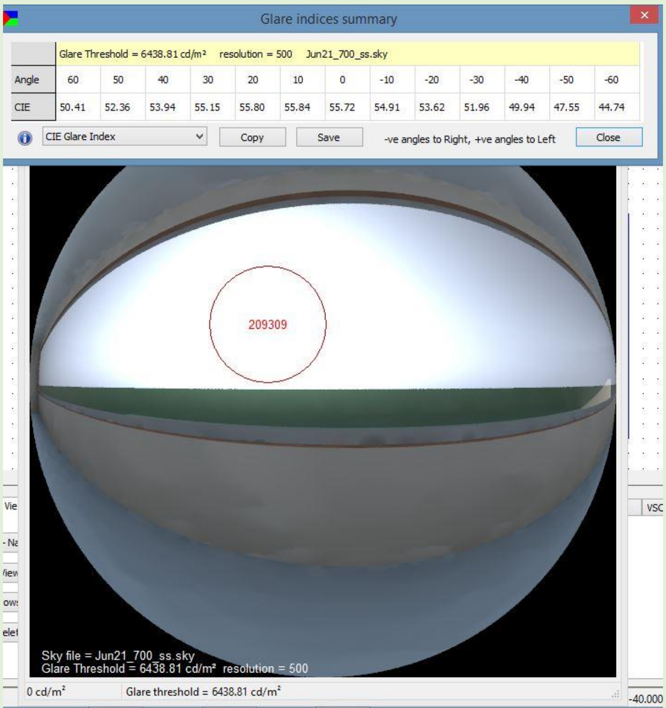
DGP



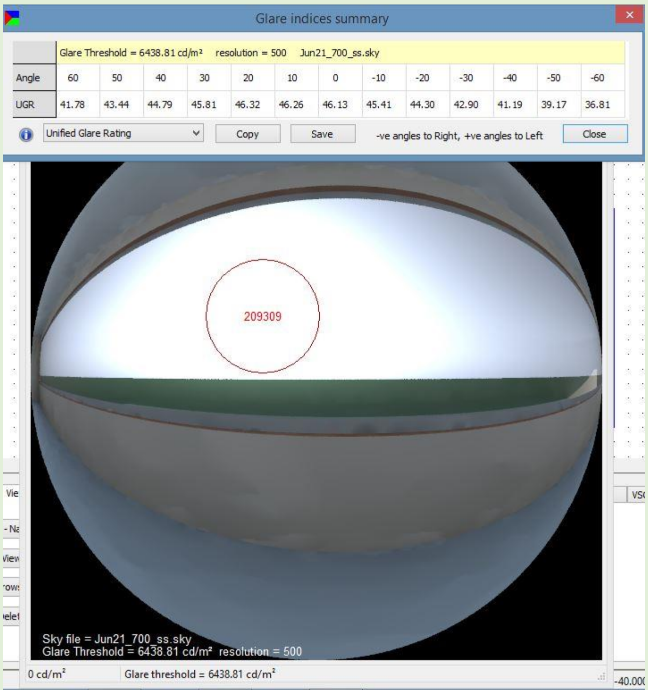
DGI

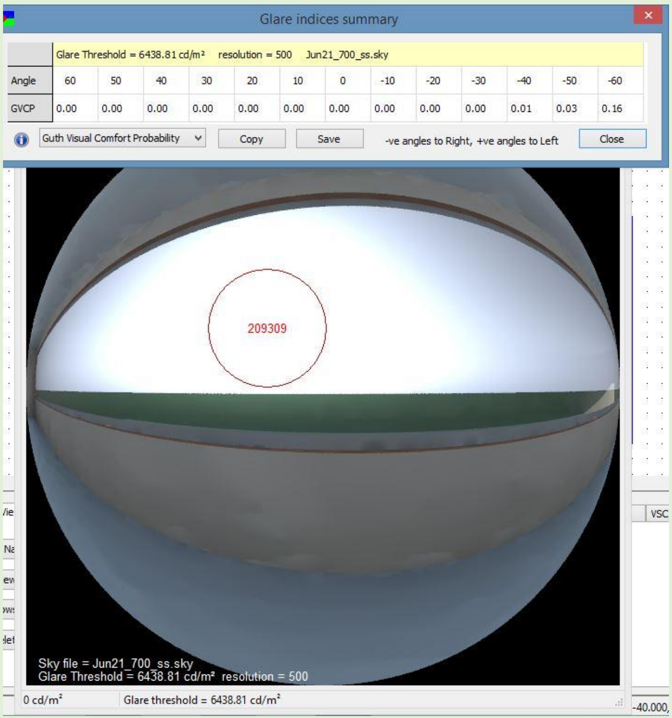
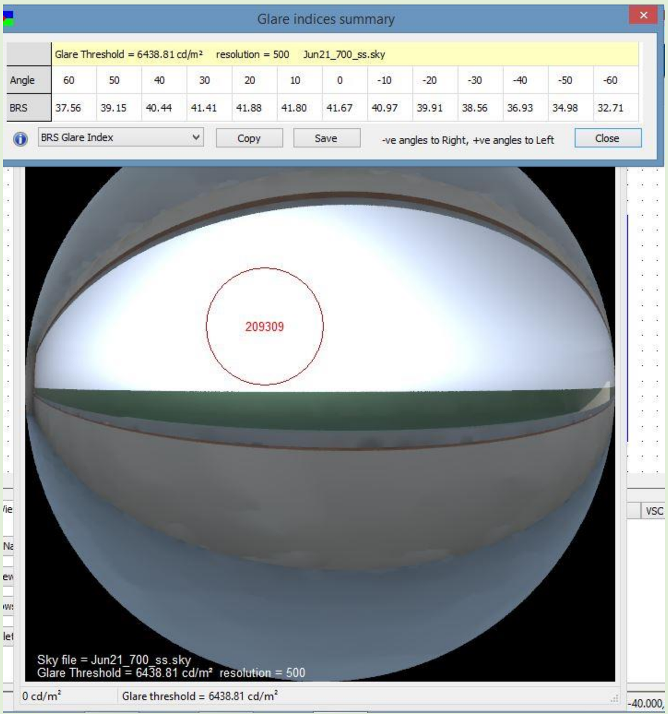


CGI



UGR

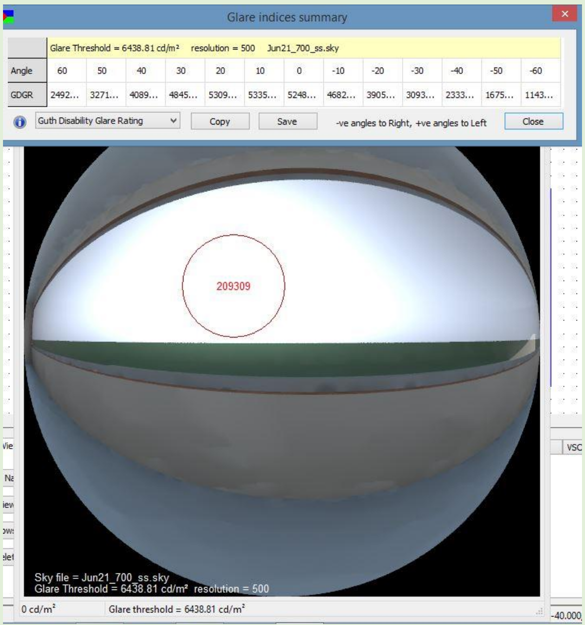


VCP	BRS
	

Glare indices summary
Glare Threshold = 6438.81 cd/m² resolution = 500 Jun21_700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.01 0.03 0.16
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
209309
Sky file = Jun21_700_ss.sky
Glare Threshold = 6438.81 cd/m² resolution = 500
0 cd/m²
Glare threshold = 6438.81 cd/m²

Glare indices summary
Glare Threshold = 6438.81 cd/m² resolution = 500 Jun21_700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 37.56 39.15 40.44 41.41 41.88 41.80 41.67 40.97 39.91 38.56 36.93 34.98 32.71
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
209309
Sky file = Jun21_700_ss.sky
Glare Threshold = 6438.81 cd/m² resolution = 500
0 cd/m²
Glare threshold = 6438.81 cd/m²

GDGR

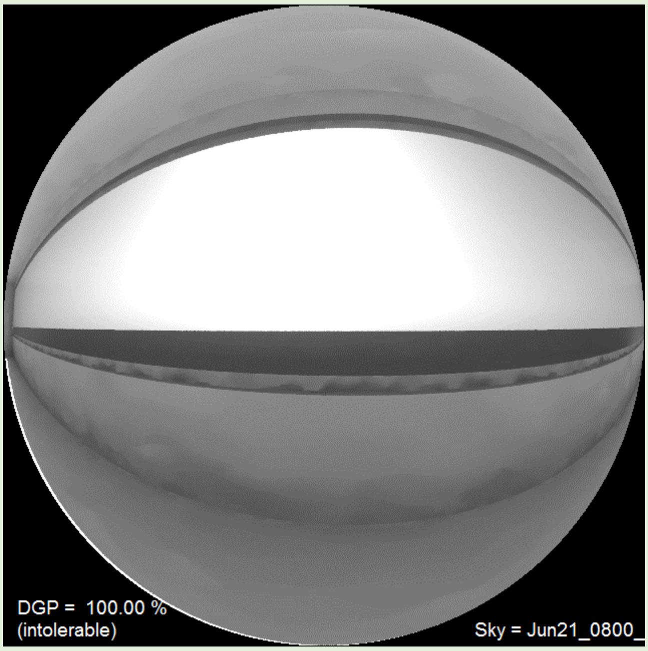


Glare indices summary
Glare Threshold = 6438.81 cd/m² resolution = 500 Jun21_700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 2492... 3271... 4089... 4845... 5309... 5335... 5248... 4682... 3905... 3093... 2333... 1675... 1143...
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
209309
Sky file = Jun21_700_ss.sky
Glare Threshold = 6438.81 cd/m² resolution = 500
0 cd/m²
Glare threshold = 6438.81 cd/m²

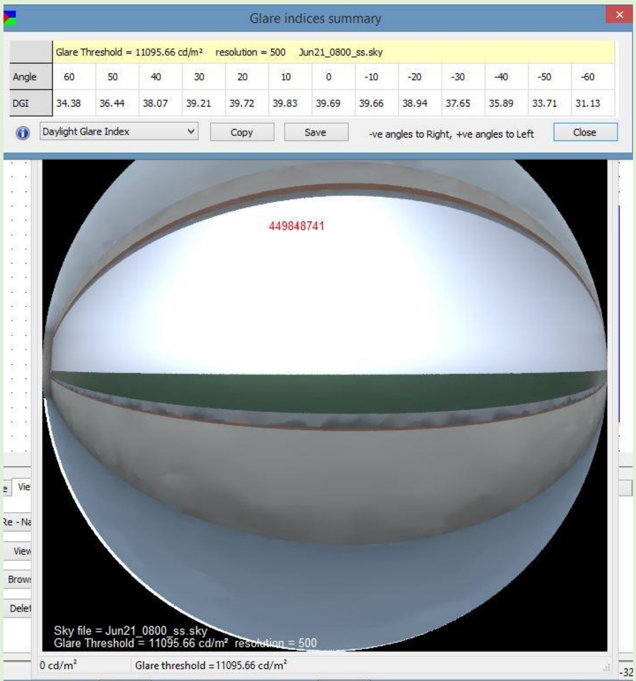
Table 173: Daylight and Glare Analysis for Jun 21, with sunny sky, (E), (P4/2m),(T8).

Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P4/2m) (T8).

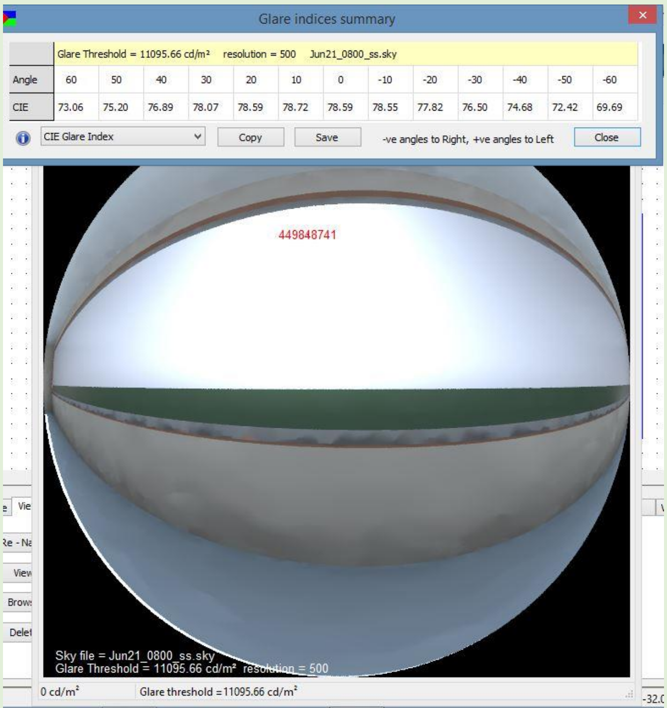
DGP



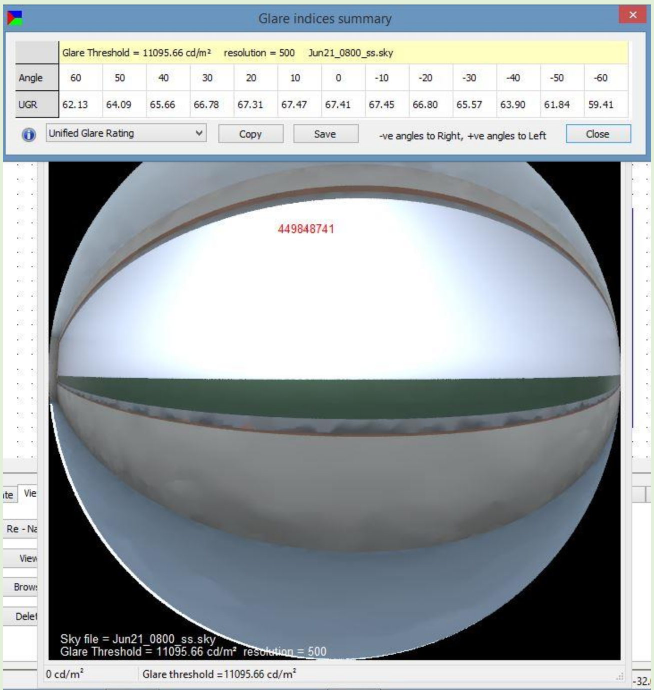
DGI

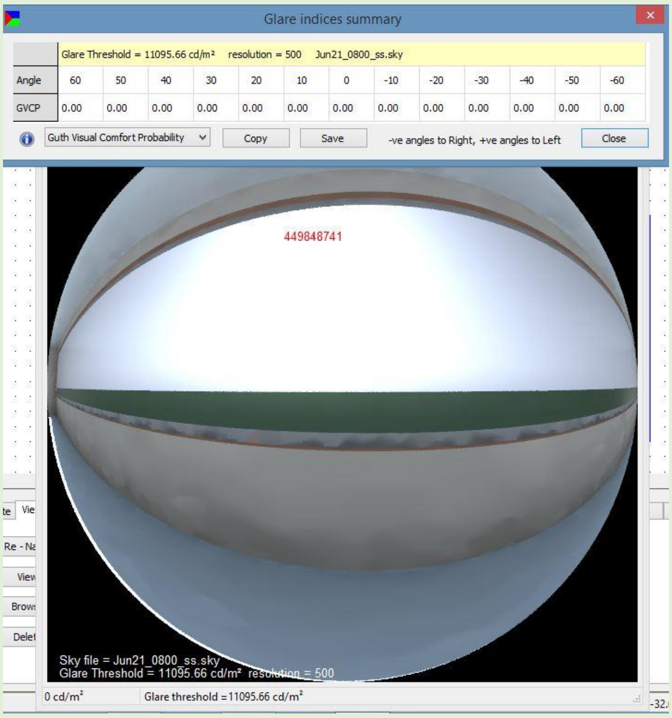
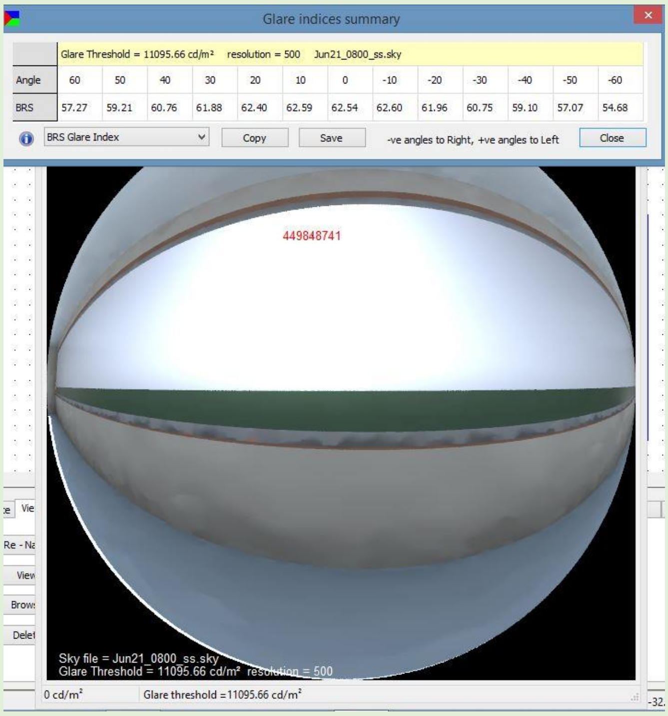


CGI



UGR

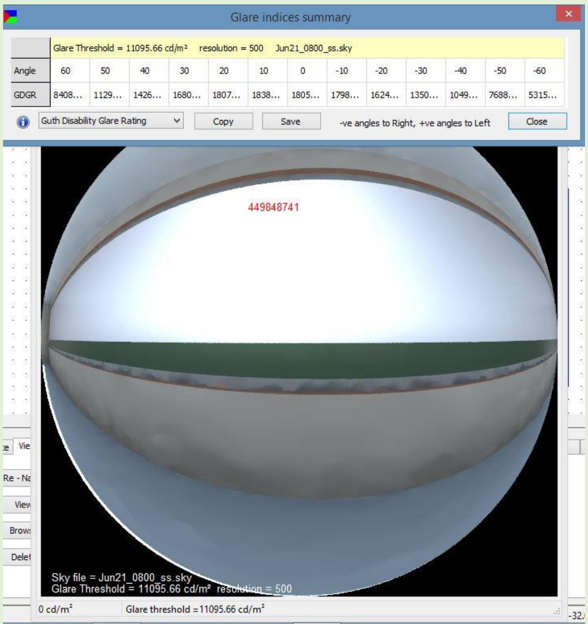


VCP	BRS
	

Glare indices summary
Glare Threshold = 11095.66 cd/m² resolution = 500 Jun21_0800_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
449848741
Sky file = Jun21_0800_ss.sky
Glare Threshold = 11095.66 cd/m² resolution = 500
0 cd/m²
Glare threshold =11095.66 cd/m²

Glare indices summary
Glare Threshold = 11095.66 cd/m² resolution = 500 Jun21_0800_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 57.27 59.21 60.76 61.88 62.40 62.59 62.54 62.60 61.96 60.75 59.10 57.07 54.68
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
449848741
Sky file = Jun21_0800_ss.sky
Glare Threshold = 11095.66 cd/m² resolution = 500
0 cd/m²
Glare threshold =11095.66 cd/m²

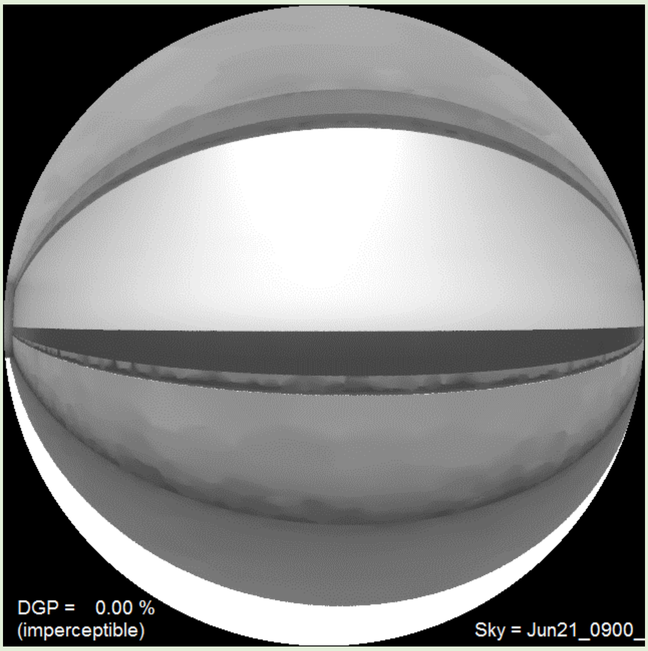
GDGR



Glare indices summary
Glare Threshold = 11095.66 cd/m² resolution = 500 Jun21_0800_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 8408... 1129... 1426... 1680... 1807... 1838... 1805... 1798... 1624... 1350... 1049... 7688... 5315...
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
449848741
Sky file = Jun21_0800_ss.sky
Glare Threshold = 11095.66 cd/m² resolution = 500
0 cd/m²
Glare threshold =11095.66 cd/m²

Table 174: Daylight and Glare Analysis for Jun 21, with sunny sky, (E), (P4/2m),(T9).

Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P4/2m) (T9).	
DGP	**VCP**



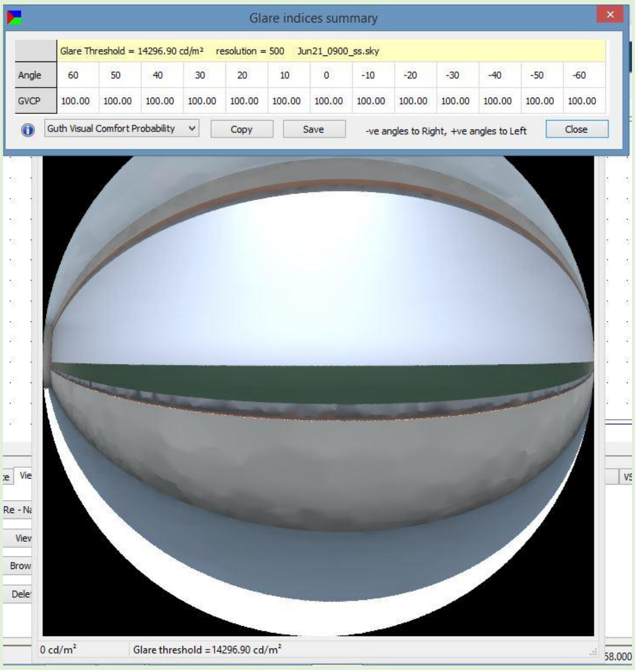
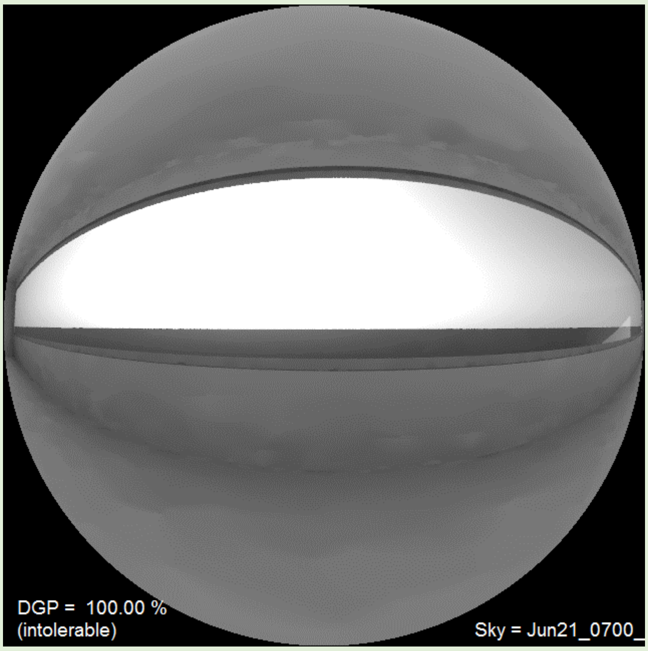


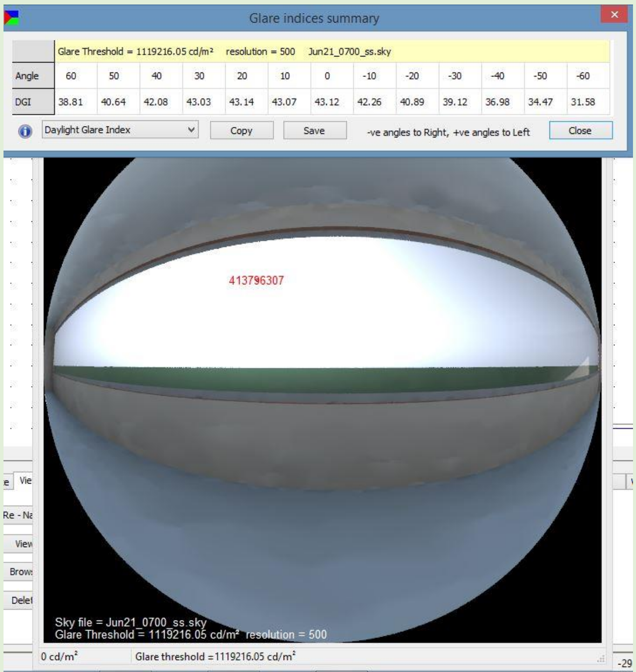
Table 175: Daylight and Glare Analysis for Jun 21, with sunny sky, (E), (P4/3m),(T7).

Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P4/3m) (T7).

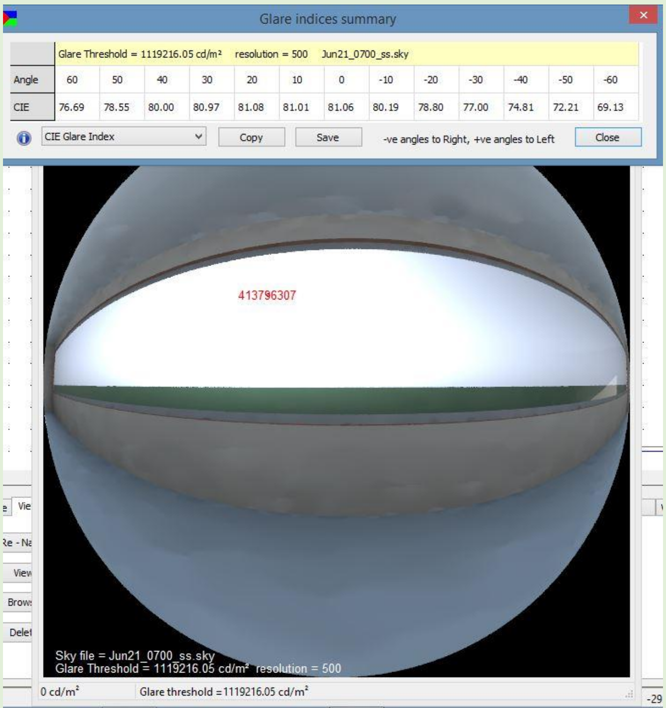
DGP



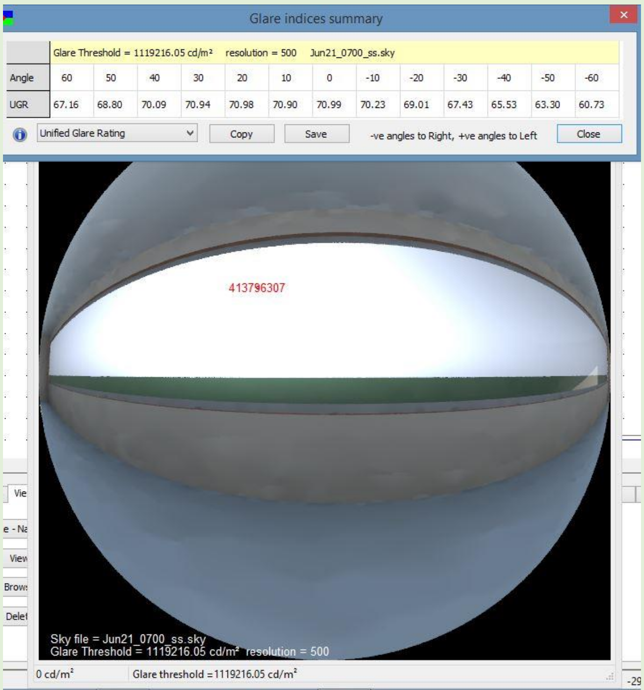
DGI

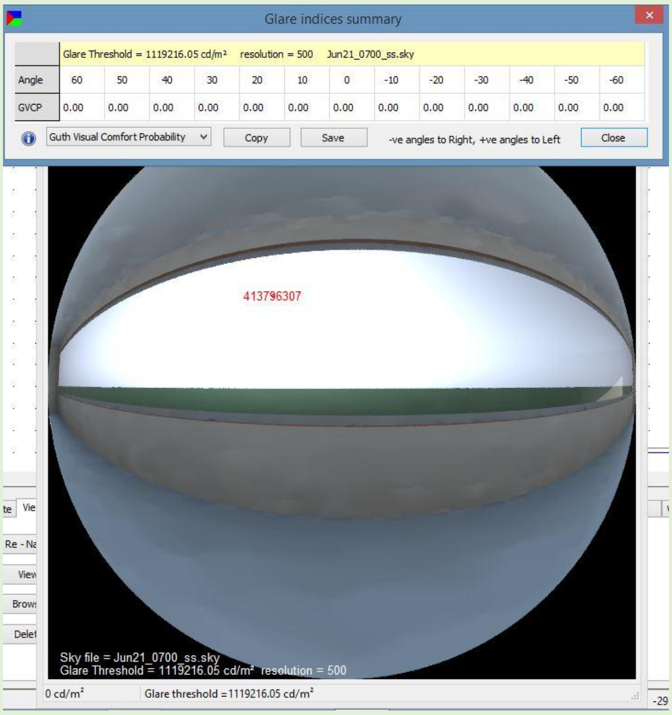
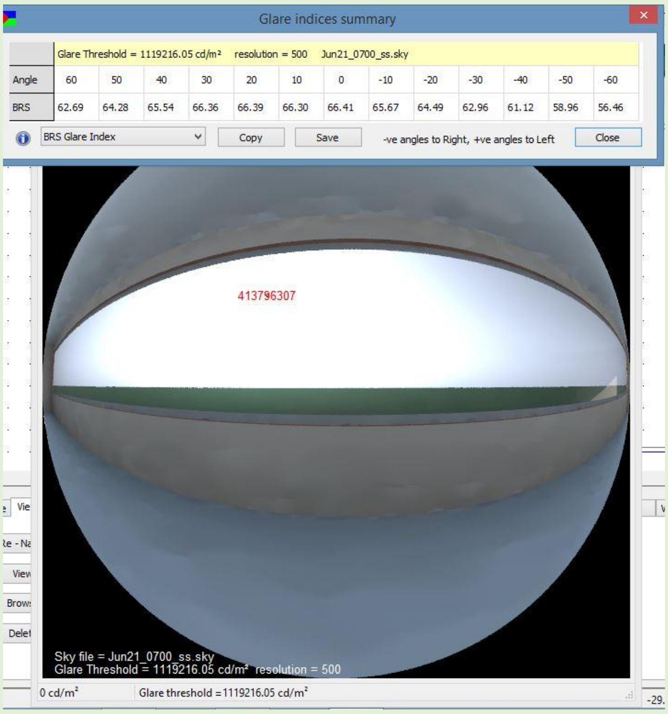


CGI



UGR

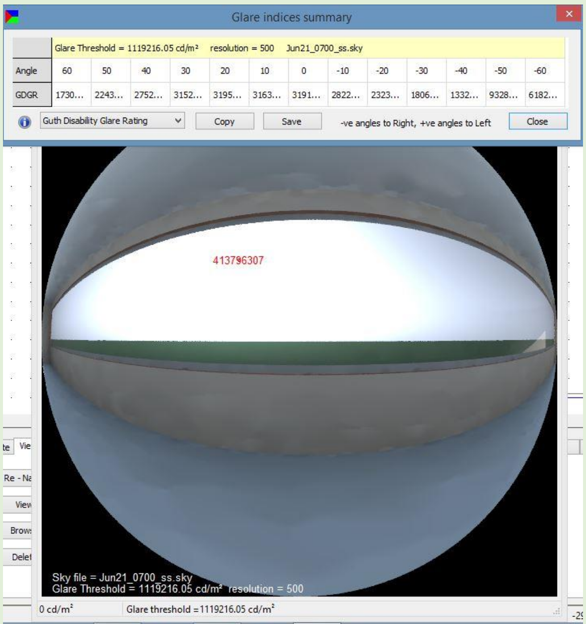


VCP	BRS
	

Glare indices summary
Glare Threshold = 1119216.05 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
413796307
Sky file = Jun21_0700_ss.sky
Glare Threshold = 1119216.05 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1119216.05 cd/m²

Glare indices summary
Glare Threshold = 1119216.05 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 62.69 64.28 65.54 66.36 66.39 66.30 66.41 65.67 64.49 62.96 61.12 58.96 56.46
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
413796307
Sky file = Jun21_0700_ss.sky
Glare Threshold = 1119216.05 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1119216.05 cd/m²

GDGR

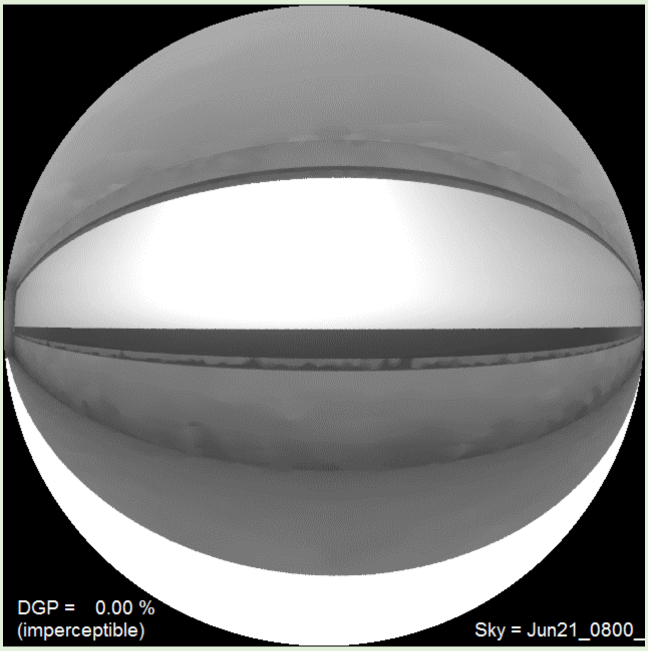


Glare indices summary
Glare Threshold = 1119216.05 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 1730... 2243... 2752... 3152... 3195... 3163... 3191... 2822... 2323... 1806... 1332... 9328... 6182...
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
413796307
Sky file = Jun21_0700_ss.sky
Glare Threshold = 1119216.05 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1119216.05 cd/m²

Table 176: Daylight and Glare Analysis for Jun 21, with sunny sky, (E), (P4/3m),(T8).

Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P4/3m) (T8).

DGP



VCP

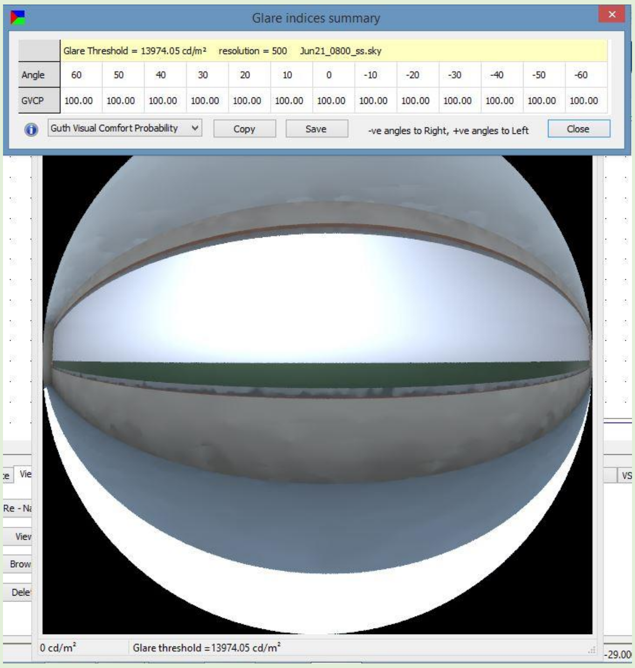
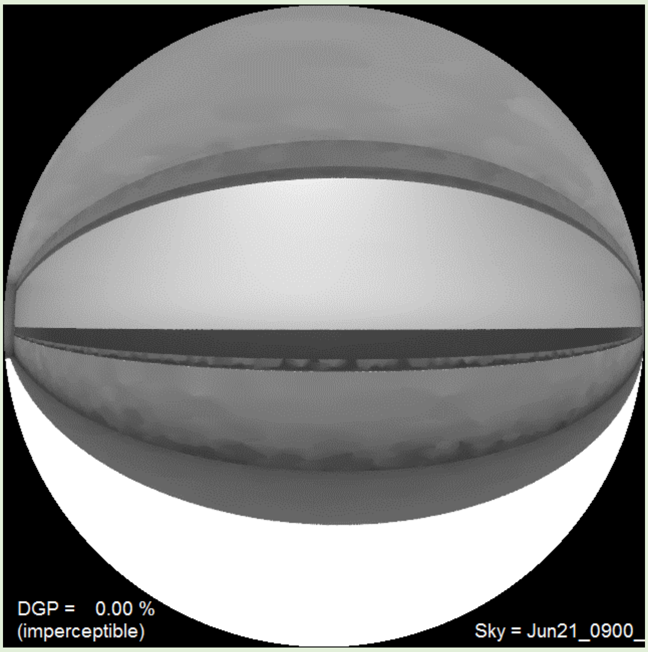


Table 177: Daylight and Glare Analysis for Jun 21, with sunny sky, (E), (P4/3m),(T9).

Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P4/3m) (T9).

DGP



VCP

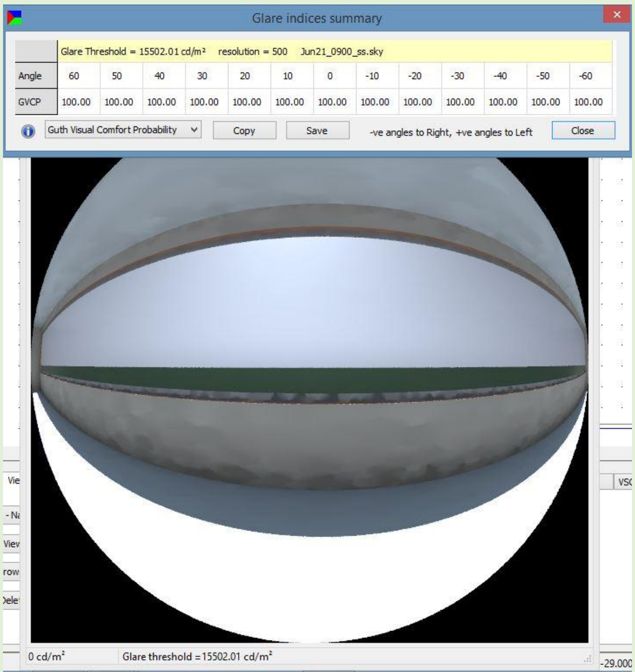


Table 178: Daylight and Glare Analysis for Jun 21, with sunny sky, (E), (P4/3m),(T12).

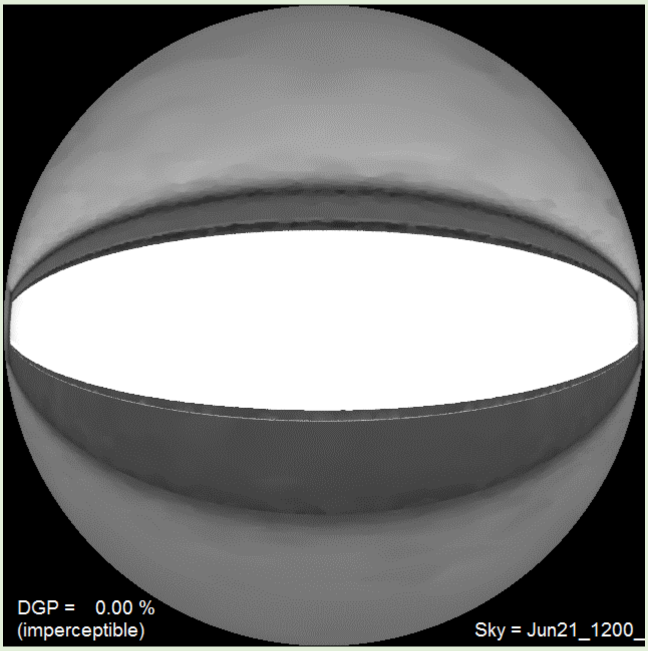
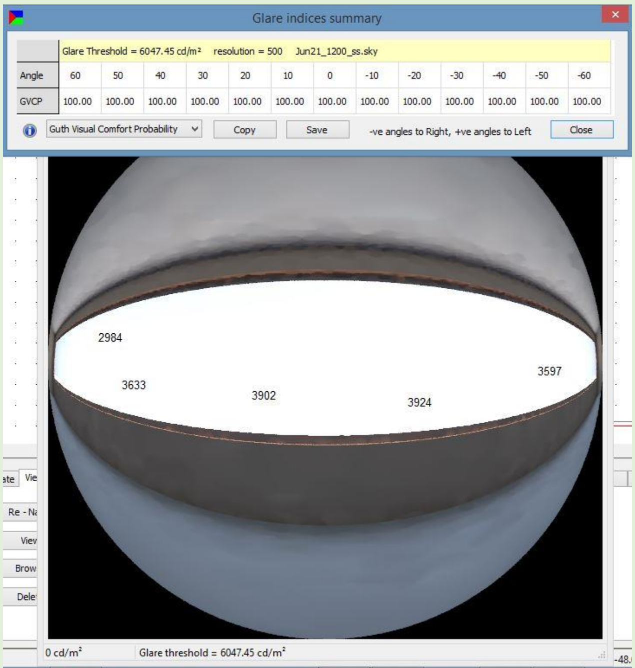
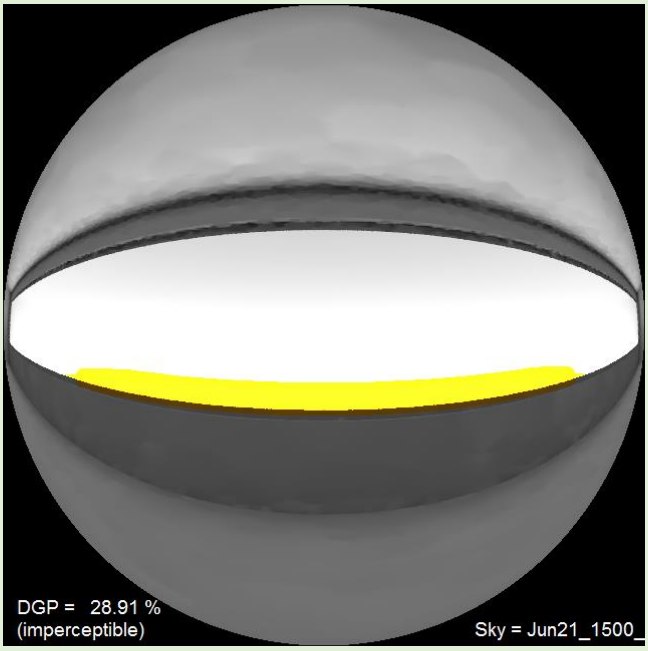
Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P4/3m) (T12).	
DGP	**VCP**
	

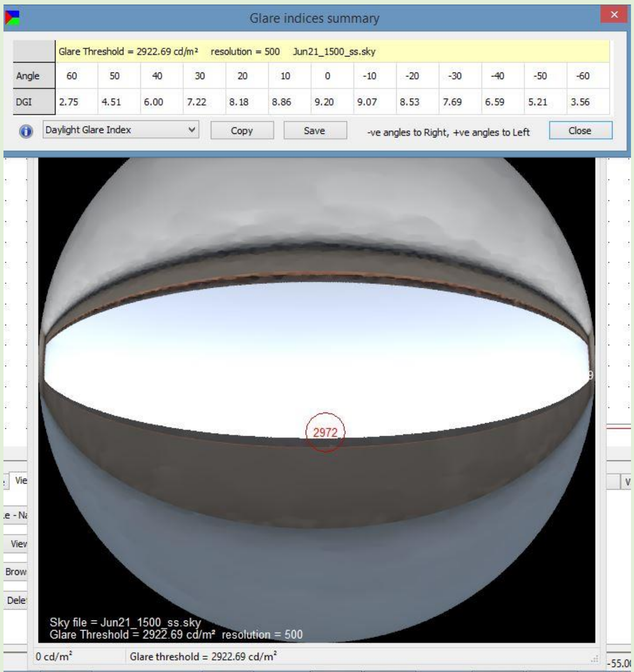
Table 179: Daylight and Glare Analysis for Jun 21, with sunny sky, (E), (P4/3m),(T15).

Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P4/3m) (T15).

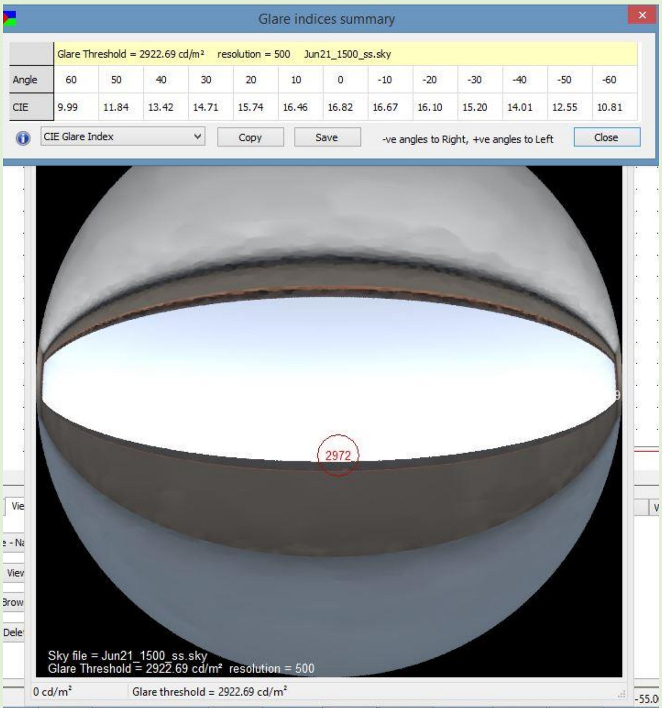
DGP



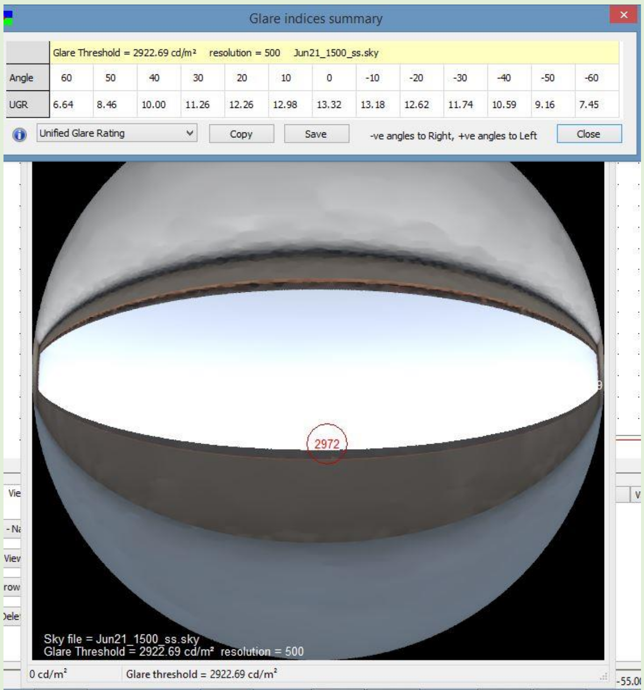
DGI

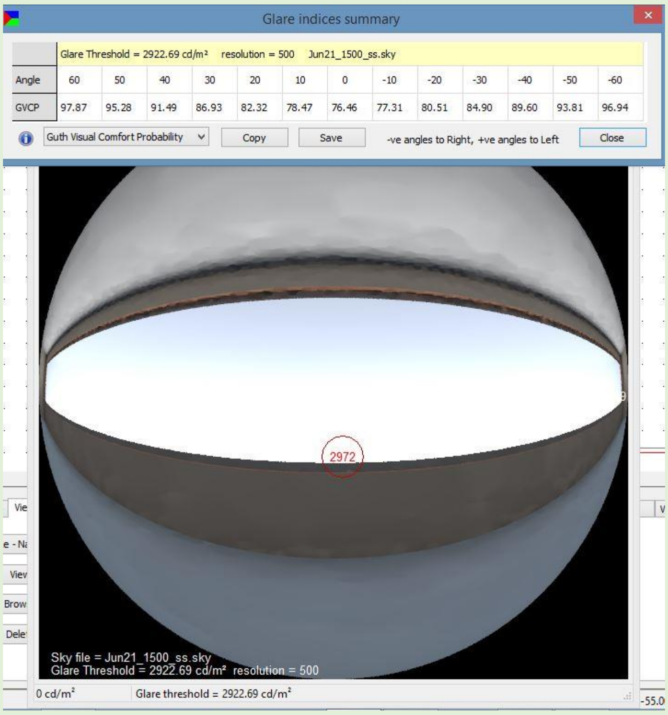
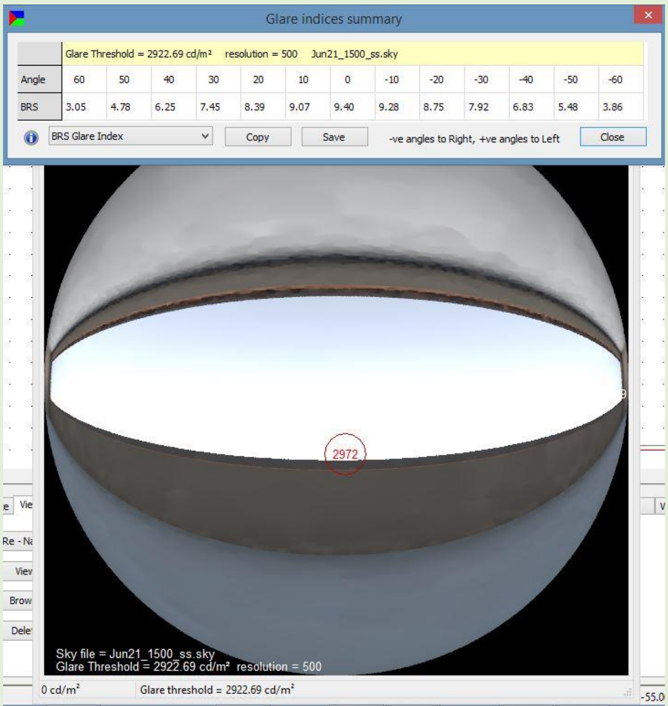


CGI



UGR

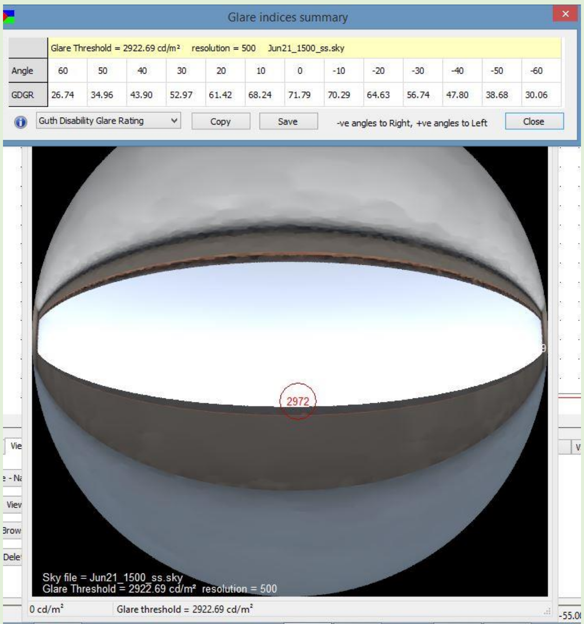


VCP	BRS
	

Glare indices summary
Glare Threshold = 2922.69 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 97.87 95.28 91.49 86.93 82.32 78.47 76.46 77.31 80.51 84.90 89.60 93.81 96.94
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2972
Sky file = Jun21_1500_ss.sky
Glare Threshold = 2922.69 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2922.69 cd/m²

Glare indices summary
Glare Threshold = 2922.69 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 3.05 4.78 6.25 7.45 8.39 9.07 9.40 9.28 8.75 7.92 6.83 5.48 3.86
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2972
Sky file = Jun21_1500_ss.sky
Glare Threshold = 2922.69 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2922.69 cd/m²

GDGR

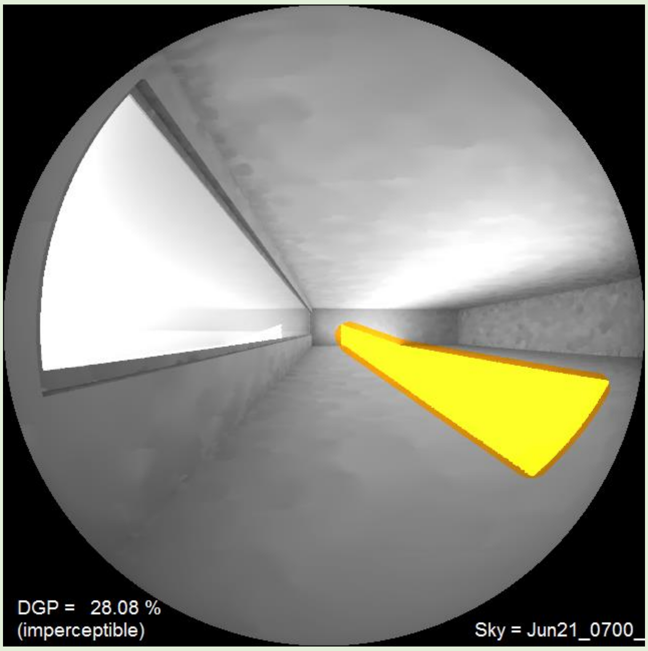


Glare indices summary
Glare Threshold = 2922.69 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 26.74 34.96 43.90 52.97 61.42 68.24 71.79 70.29 64.63 56.74 47.80 38.68 30.06
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2972
Sky file = Jun21_1500_ss.sky
Glare Threshold = 2922.69 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2922.69 cd/m²

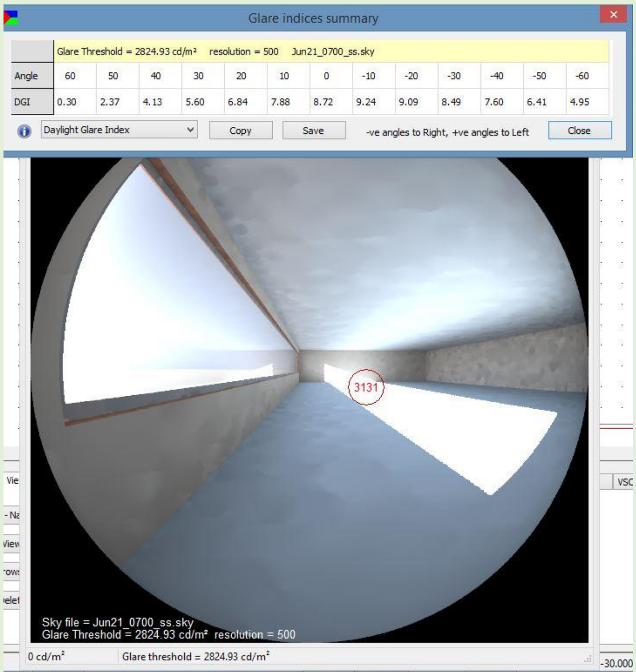
Table 180: Daylight and Glare Analysis for Jun 21, with sunny sky, (E), (P5/1.5m),(T7).

Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P5/1.5m) (T7).

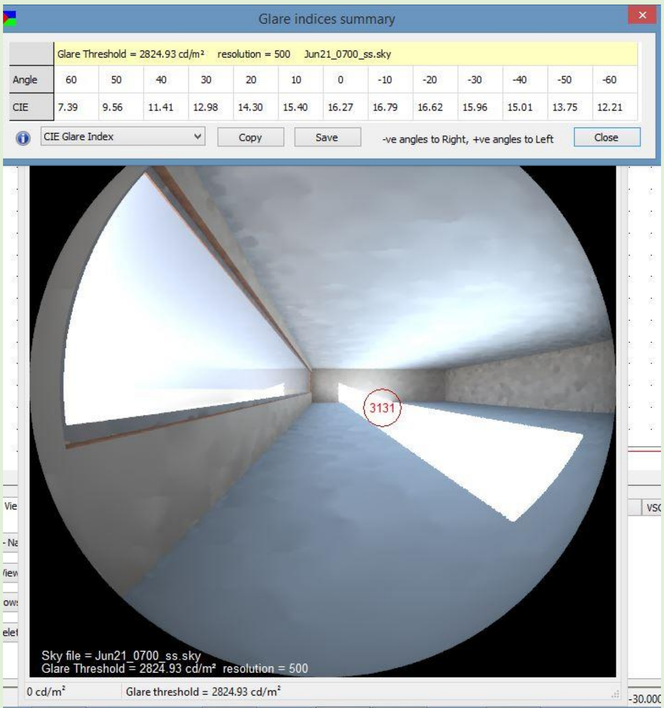
DGP



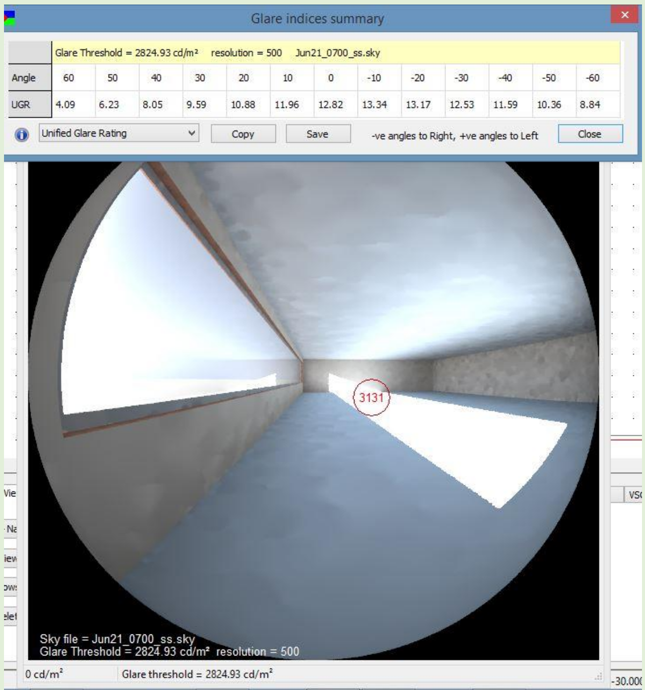
DGI

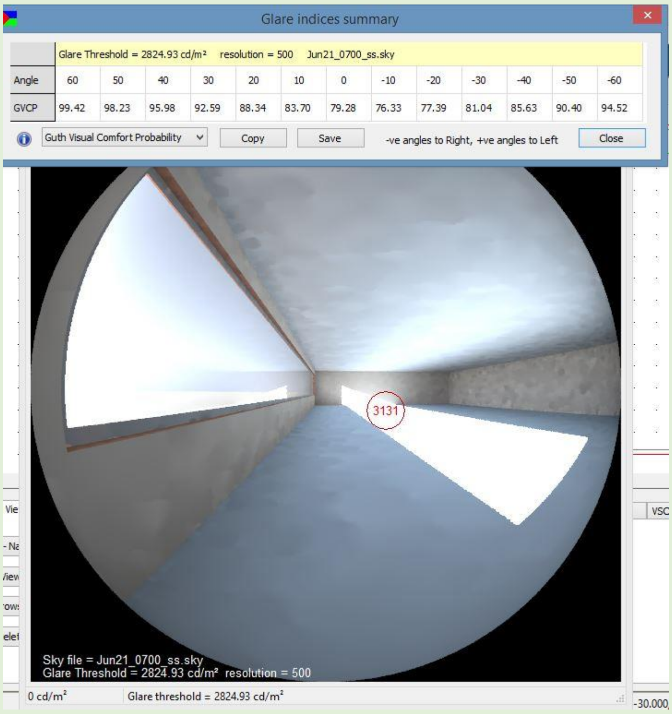
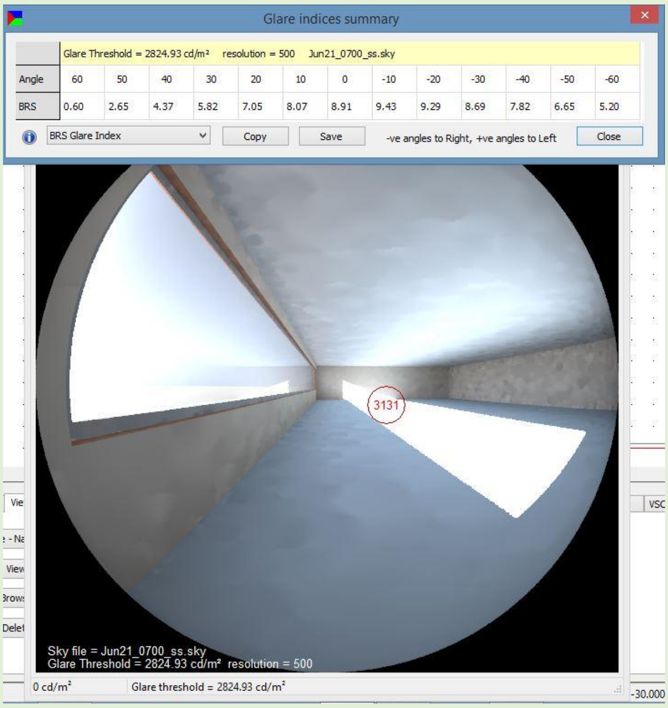


CGI



UGR

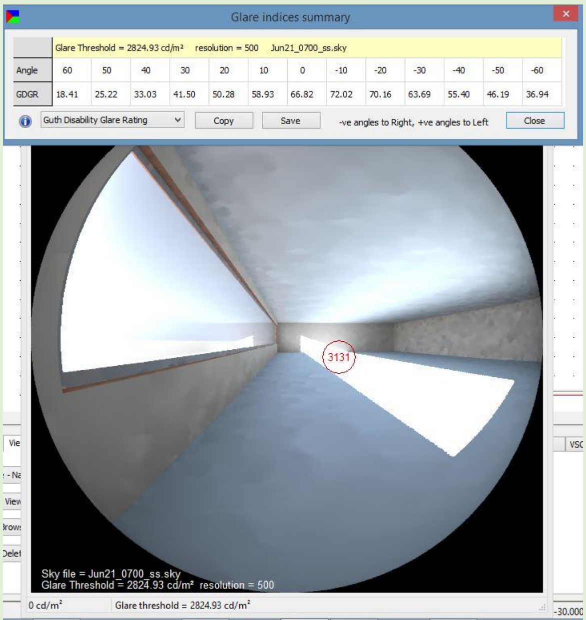


VCP	BRS
	

Glare indices summary
Glare Threshold = 2824.93 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 99.42 98.23 95.98 92.59 88.34 83.70 79.28 76.33 77.39 81.04 85.63 90.40 94.52
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3131
Sky file = Jun21_0700_ss.sky
Glare Threshold = 2824.93 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2824.93 cd/m²
-30.000

Glare indices summary
Glare Threshold = 2824.93 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 0.60 2.65 4.37 5.82 7.05 8.07 8.91 9.43 9.29 8.69 7.82 6.65 5.20
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3131
Sky file = Jun21_0700_ss.sky
Glare Threshold = 2824.93 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2824.93 cd/m²
-30.000

GDGR

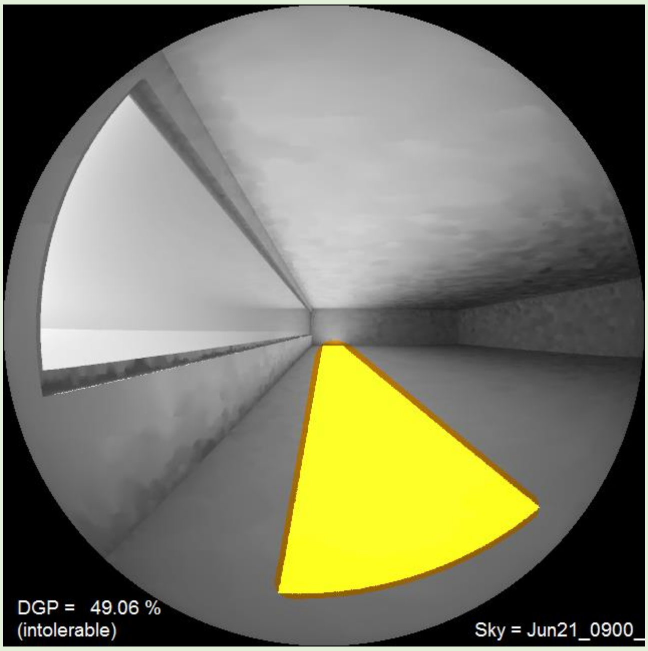


Glare indices summary
Glare Threshold = 2824.93 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 18.41 25.22 33.03 41.50 50.28 58.93 66.82 72.02 70.16 63.69 55.40 46.19 36.94
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3131
Sky file = Jun21_0700_ss.sky
Glare Threshold = 2824.93 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2824.93 cd/m²
-30.000

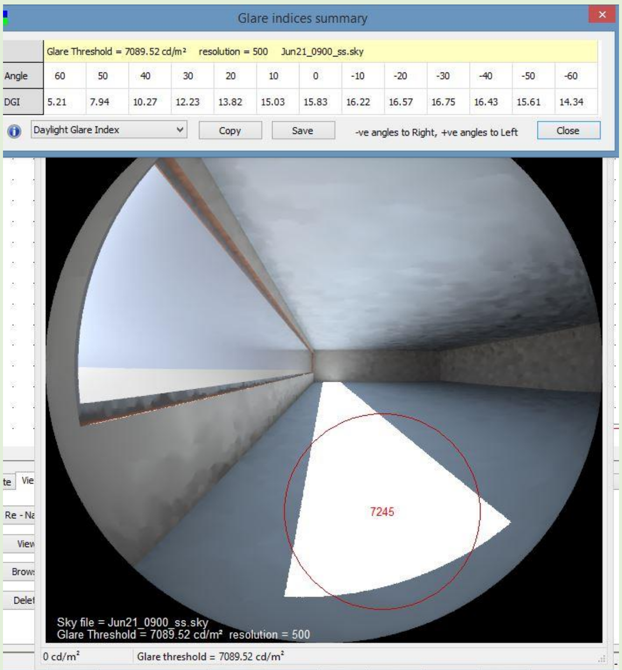
Table 181: Daylight and Glare Analysis for Jun 21, with sunny sky, (E), (P5/1.5m),(T9).

Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P5/1.5m) (T9).

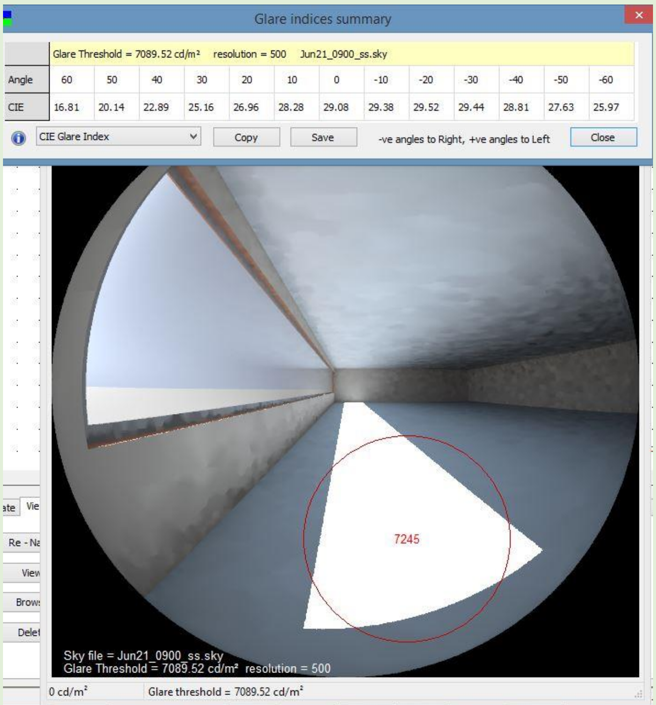
DGP



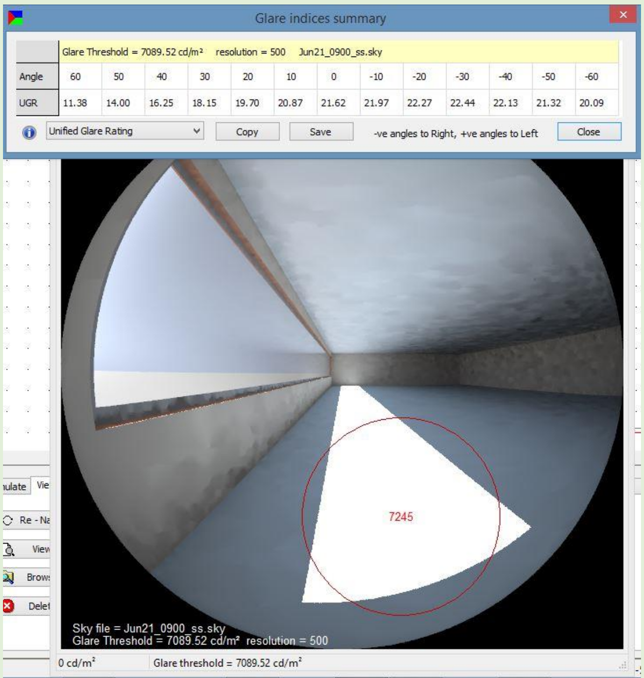
DGI



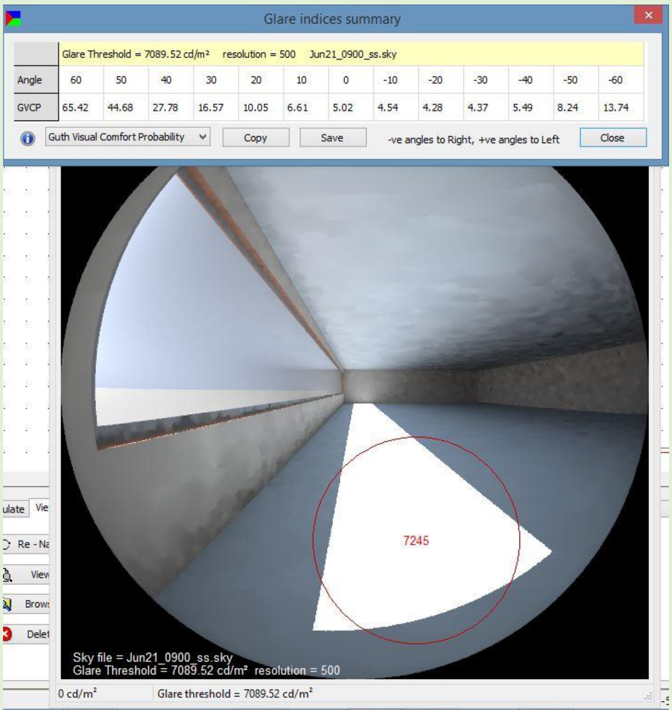
CGI

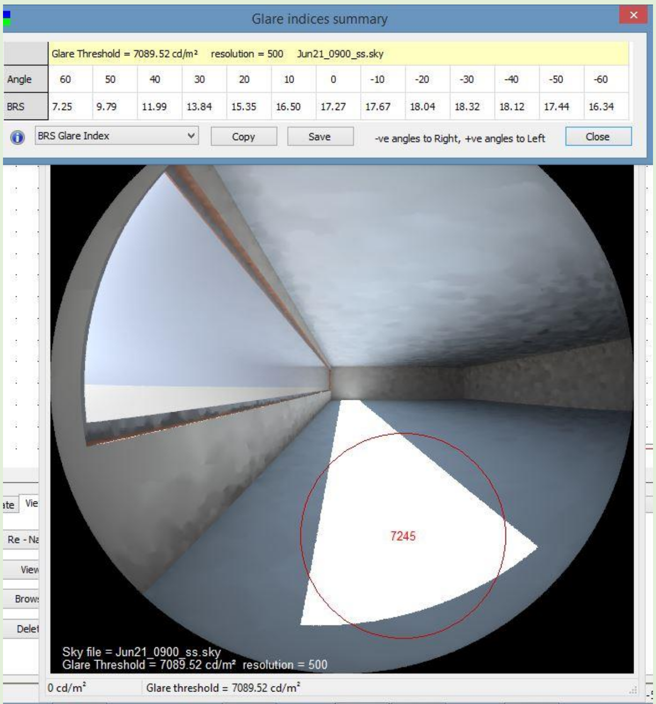


UGR



VCP	BRS


Glare indices summary
Glare Threshold = 7089.52 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 65.42 44.68 27.78 16.57 10.05 6.61 5.02 4.54 4.28 4.37 5.49 8.24 13.74
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
7245
Sky file = Jun21_0900_ss.sky
Glare Threshold = 7089.52 cd/m² resolution = 500
0 cd/m²
Glare threshold = 7089.52 cd/m²


Glare indices summary
Glare Threshold = 7089.52 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 7.25 9.79 11.99 13.84 15.35 16.50 17.27 17.67 18.04 18.32 18.12 17.44 16.34
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
7245
Sky file = Jun21_0900_ss.sky
Glare Threshold = 7089.52 cd/m² resolution = 500
0 cd/m²
Glare threshold = 7089.52 cd/m²

GDGR

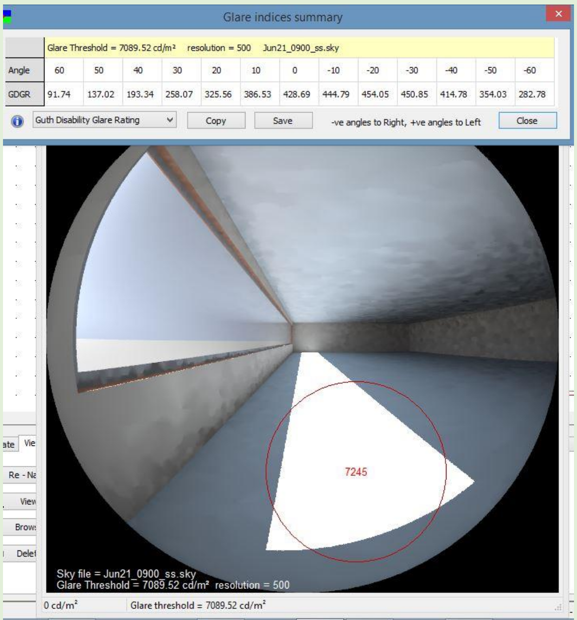
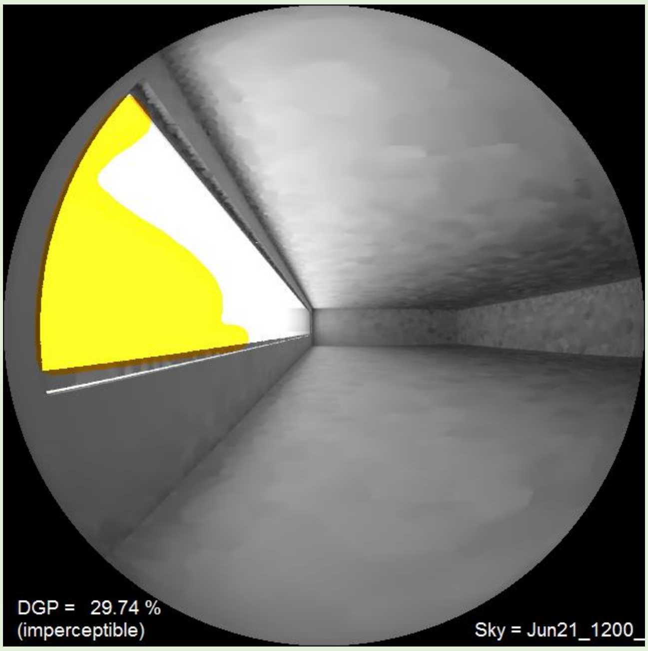

Glare indices summary
Glare Threshold = 7089.52 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 91.74 137.02 193.34 258.07 325.56 386.53 428.69 444.79 454.05 450.85 414.78 354.03 282.78
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
7245
Sky file = Jun21_0900_ss.sky
Glare Threshold = 7089.52 cd/m² resolution = 500
0 cd/m²
Glare threshold = 7089.52 cd/m²

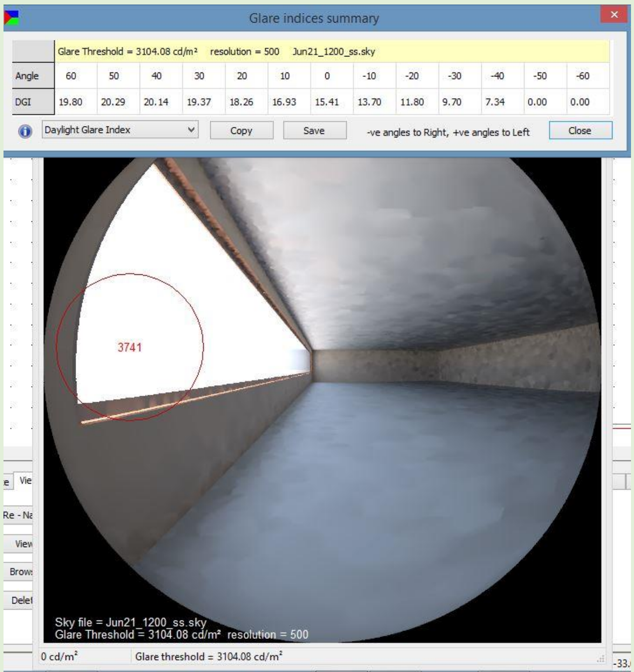
Table 182: Daylight and Glare Analysis for Jun 21, with sunny sky, (E), (P5/1.5m),(T12).

Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P5/1.5m) (T12).

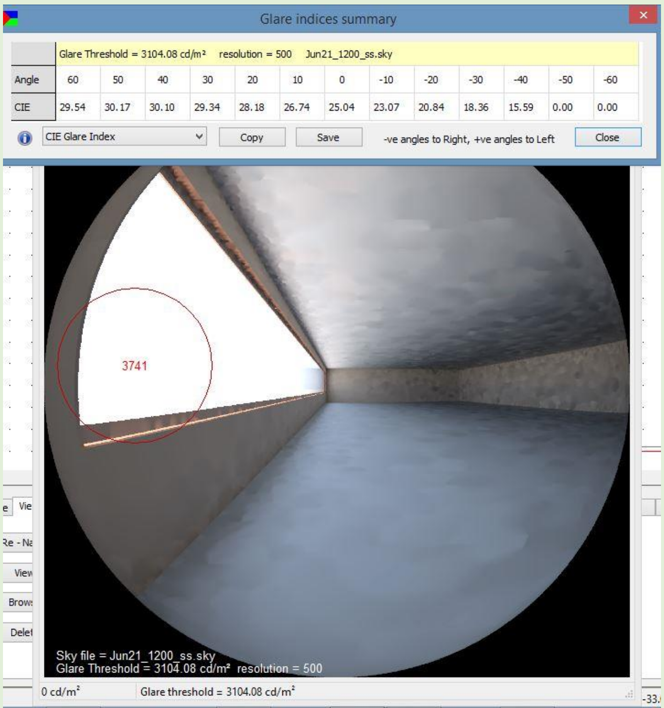
DGP



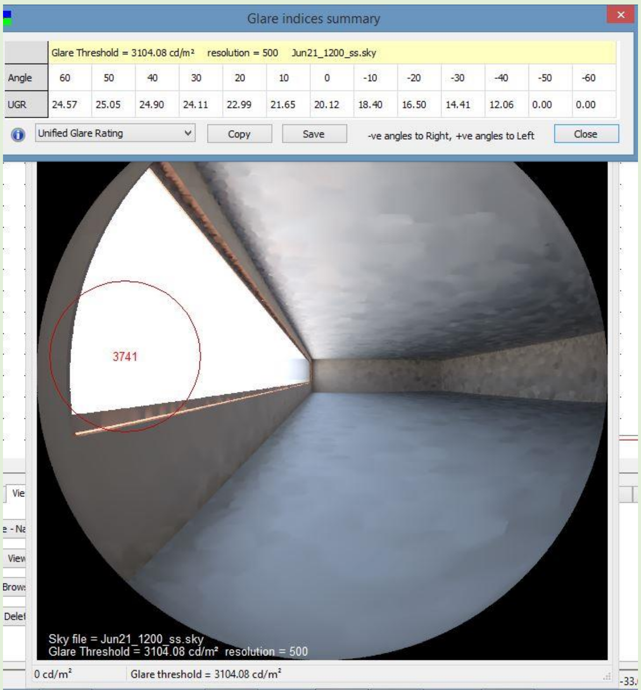
DGI



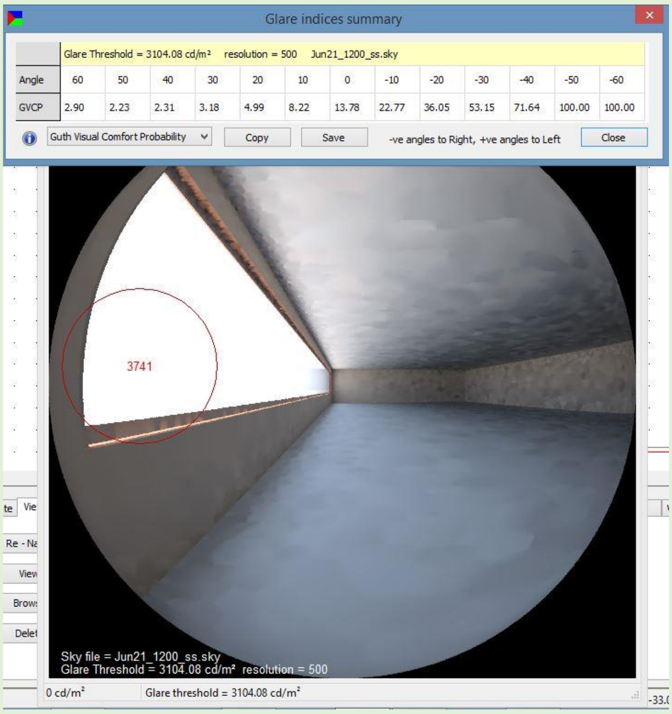
CGI



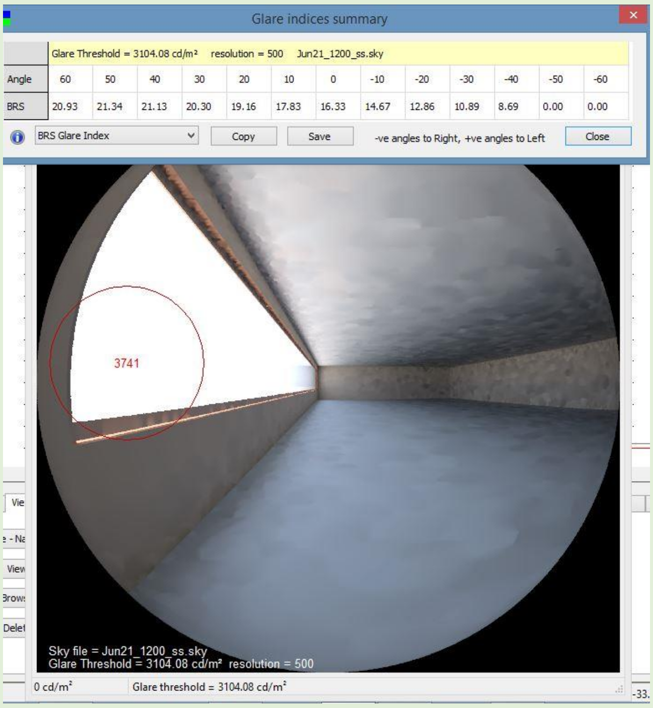
UGR



VCP


Glare indices summary
Glare Threshold = 3104.08 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 2.90 2.23 2.31 3.18 4.99 8.22 13.78 22.77 36.05 53.15 71.64 100.00 100.00
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3741
Sky file = Jun21_1200_ss.sky
Glare Threshold = 3104.08 cd/m² resolution = 500
0 cd/m²
Glare threshold = 3104.08 cd/m²

BRS


Glare indices summary
Glare Threshold = 3104.08 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 20.93 21.34 21.13 20.30 19.16 17.83 16.33 14.67 12.86 10.89 8.69 0.00 0.00
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3741
Sky file = Jun21_1200_ss.sky
Glare Threshold = 3104.08 cd/m² resolution = 500
0 cd/m²
Glare threshold = 3104.08 cd/m²

GDGR

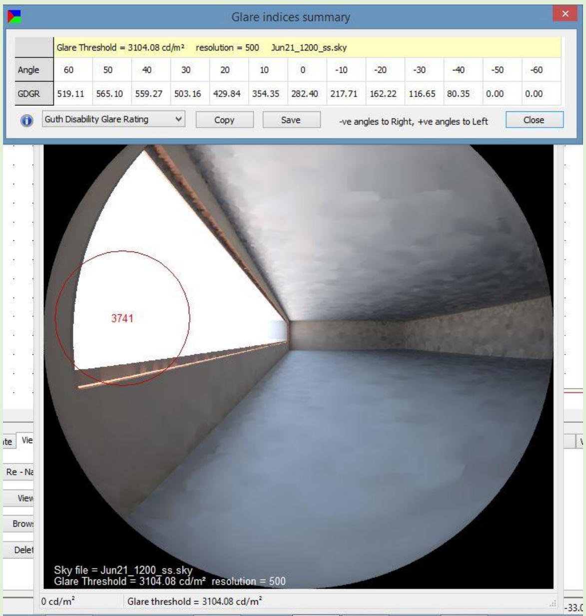
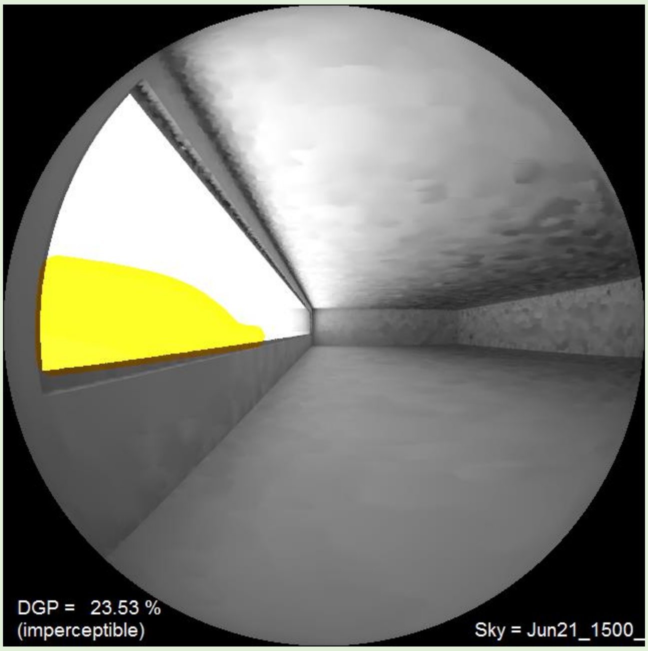

Glare indices summary
Glare Threshold = 3104.08 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 519.11 565.10 559.27 503.16 429.84 354.35 282.40 217.71 162.22 116.65 80.35 0.00 0.00
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3741
Sky file = Jun21_1200_ss.sky
Glare Threshold = 3104.08 cd/m² resolution = 500
0 cd/m²
Glare threshold = 3104.08 cd/m²

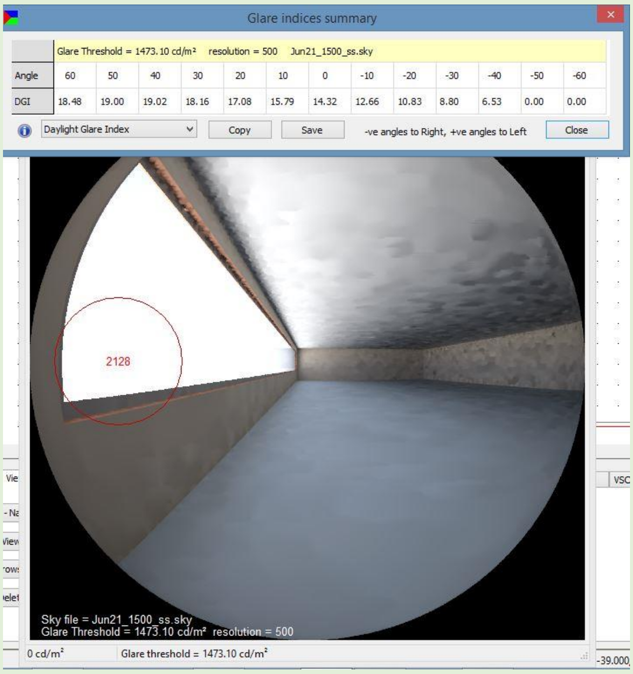
Table 183: Daylight and Glare Analysis for Jun 21, with sunny sky, (E), (P5/1.5m),(T15).

Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P5/1.5m) (T15).

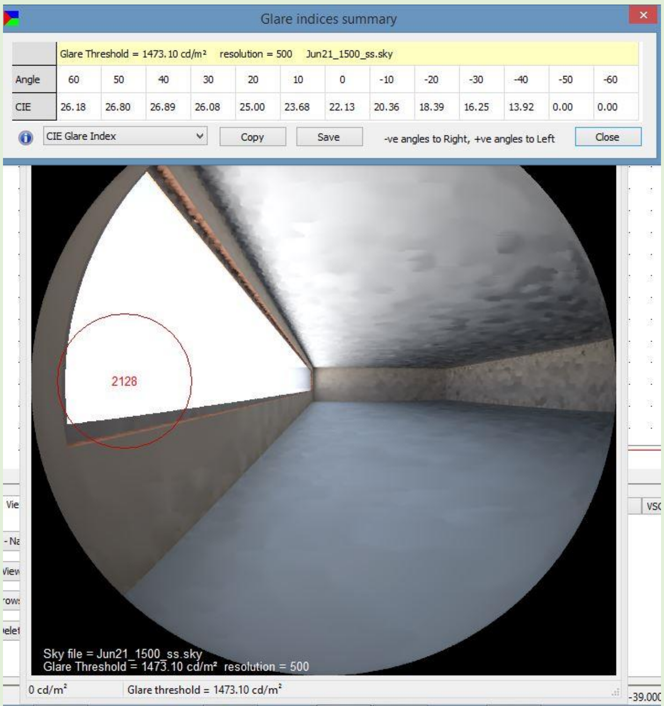
DGP



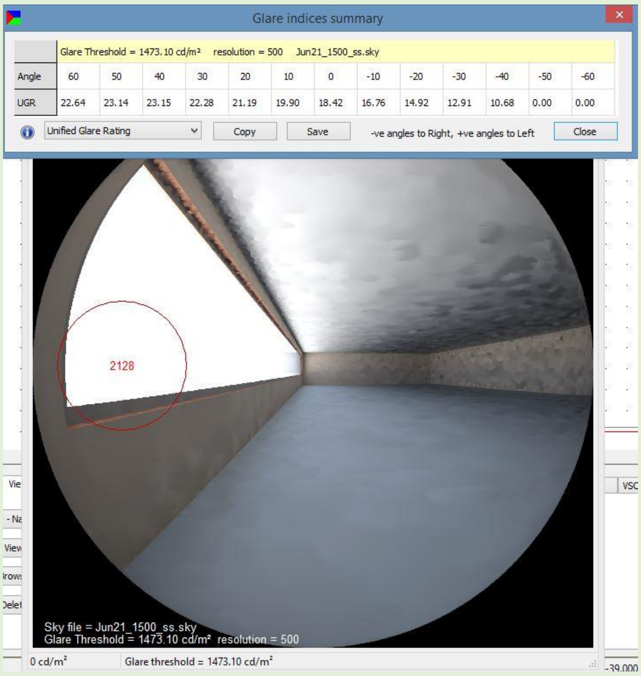
DGI



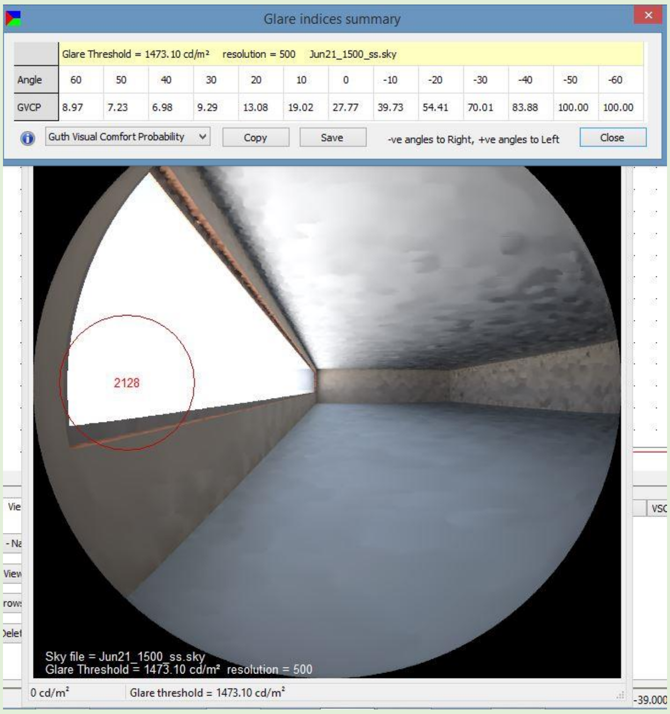
CGI



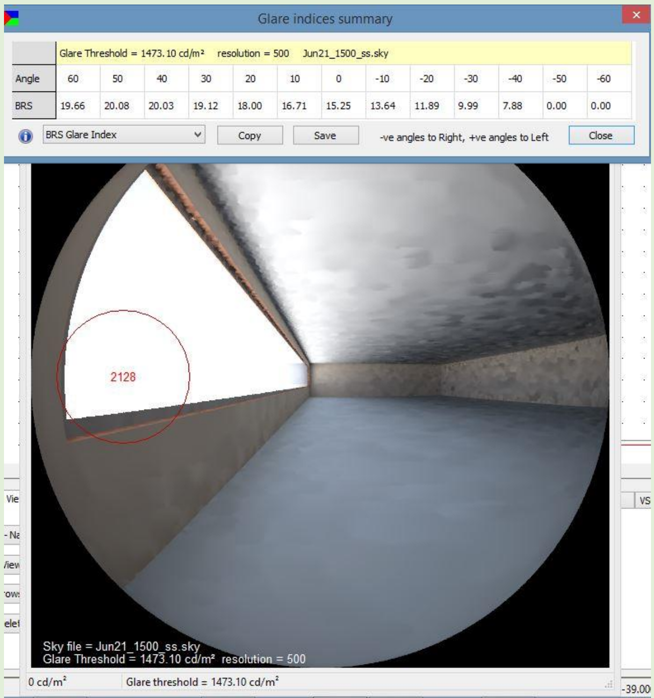
UGR



VCP


Glare indices summary
Glare Threshold = 1473.10 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 8.97 7.23 6.98 9.29 13.08 19.02 27.77 39.73 54.41 70.01 83.88 100.00 100.00
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2128
Sky file = Jun21_1500_ss.sky
Glare Threshold = 1473.10 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1473.10 cd/m²
-39.000

BRS


Glare indices summary
Glare Threshold = 1473.10 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 19.66 20.08 20.03 19.12 18.00 16.71 15.25 13.64 11.89 9.99 7.88 0.00 0.00
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2128
Sky file = Jun21_1500_ss.sky
Glare Threshold = 1473.10 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1473.10 cd/m²
-39.00

GDGR

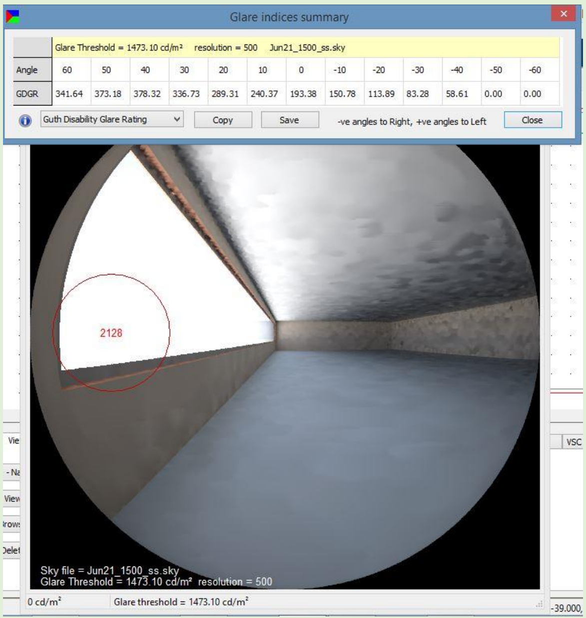
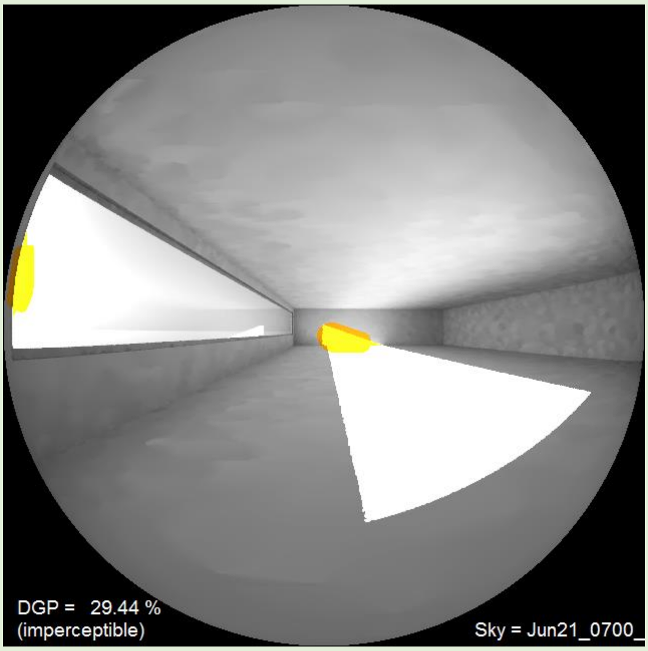

Glare indices summary
Glare Threshold = 1473.10 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 341.64 373.18 378.32 336.73 289.31 240.37 193.38 150.78 113.89 83.28 58.61 0.00 0.00
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2128
Sky file = Jun21_1500_ss.sky
Glare Threshold = 1473.10 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1473.10 cd/m²
-39.000

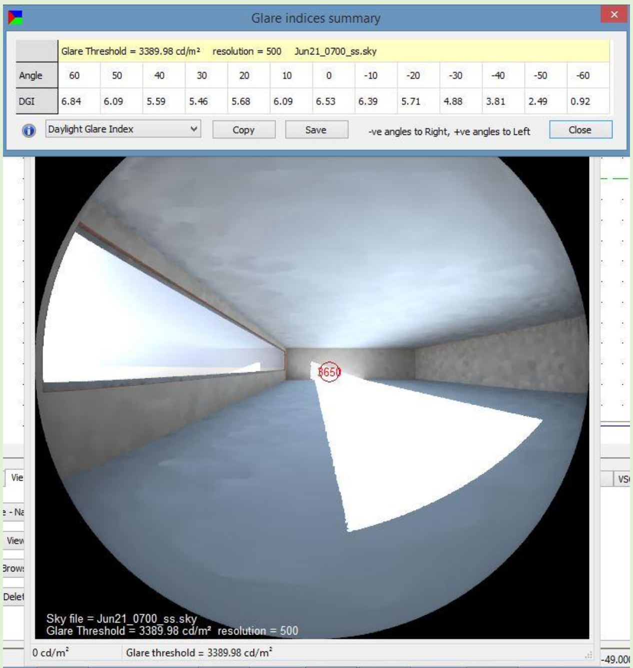
Table 184: Daylight and Glare Analysis for Jun 21, with sunny sky, (E), (P5/3m),(T7).

Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P5/3m) (T7).

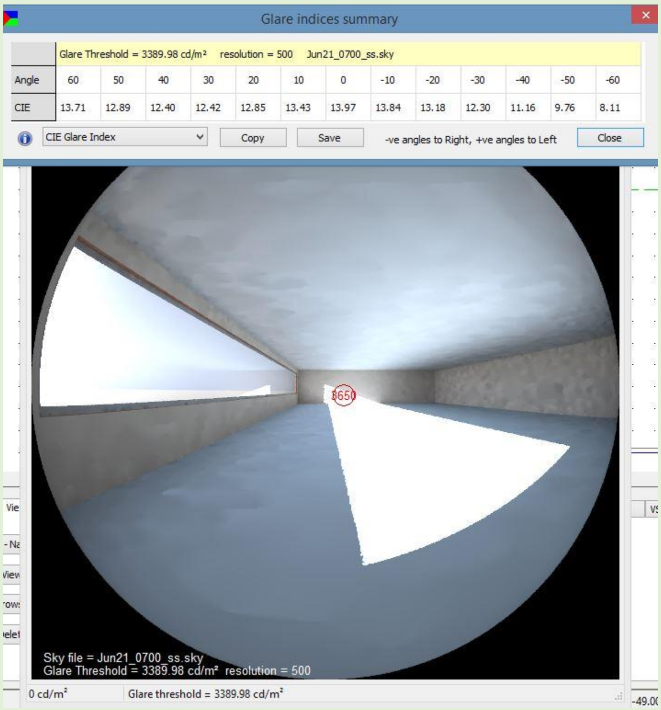
DGP



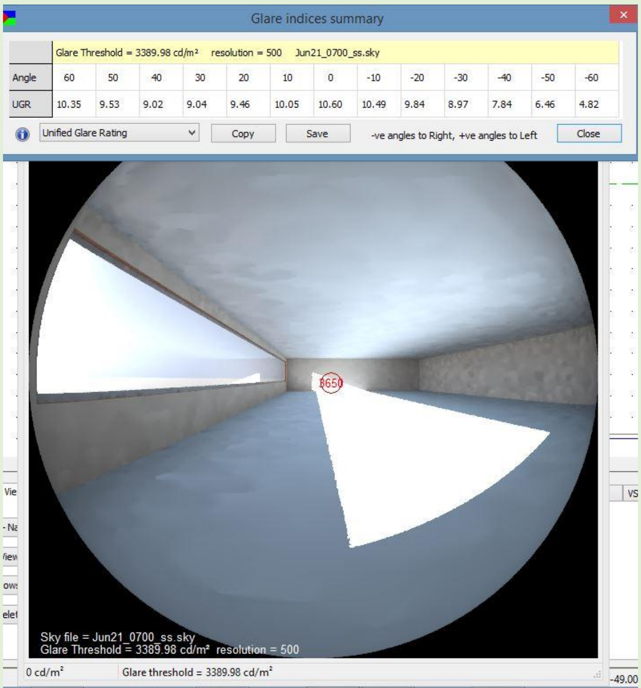
DGI



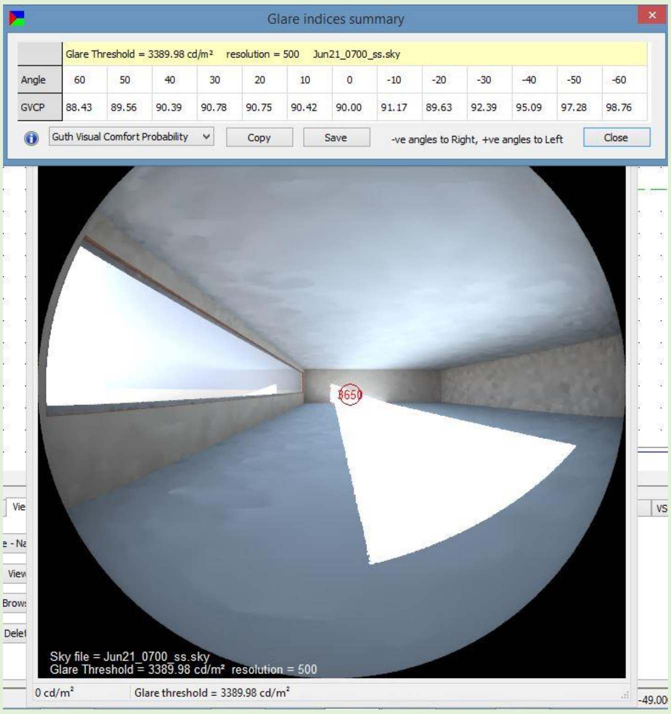
CGI



UGR

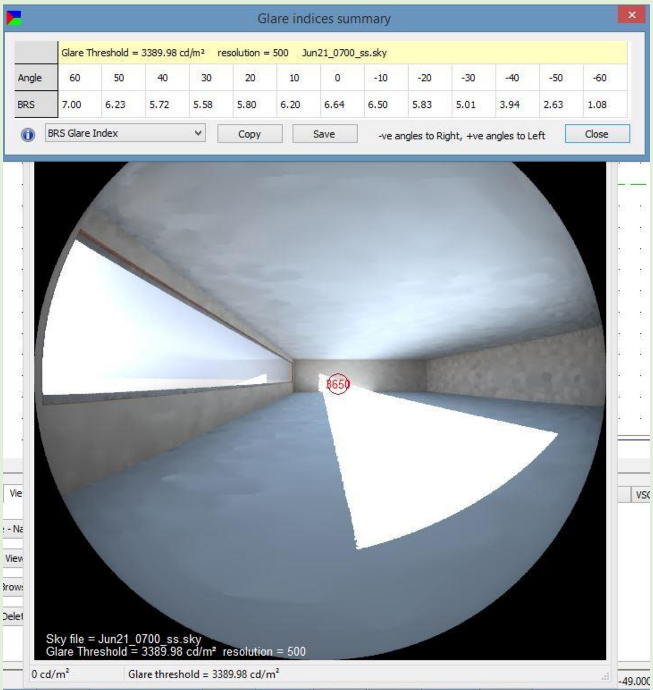


VCP



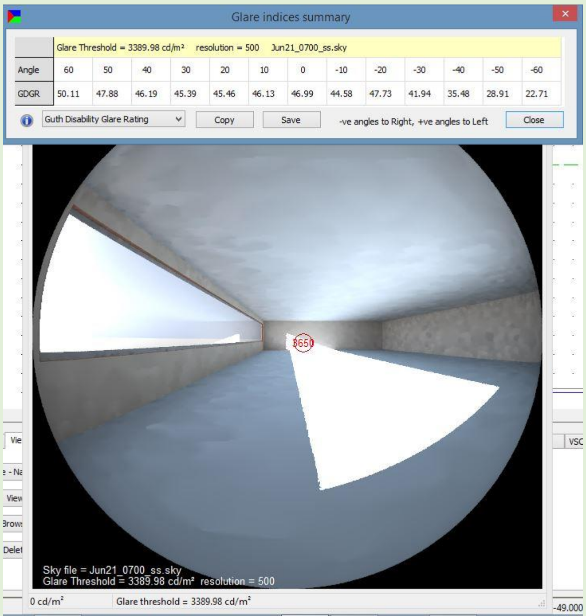
Angle	60	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
GVCP	88.43	89.56	90.39	90.78	90.75	90.42	90.00	91.17	89.63	92.39	95.09	97.28	98.76

BRS



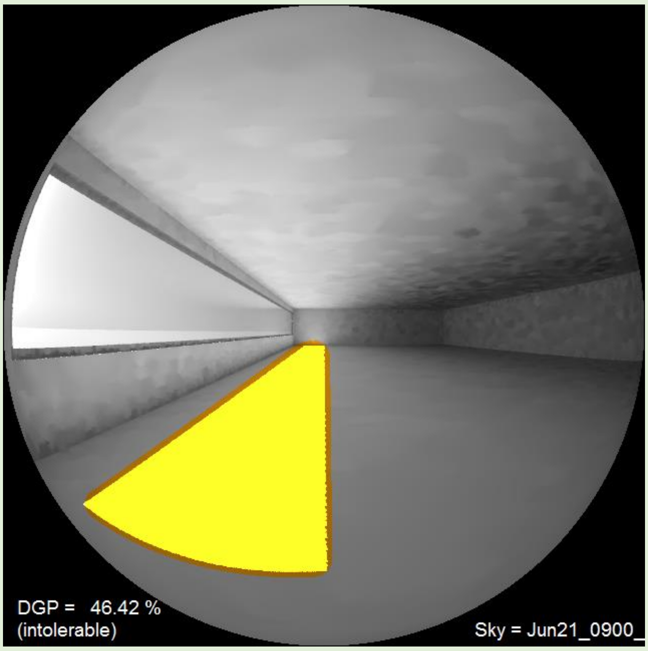
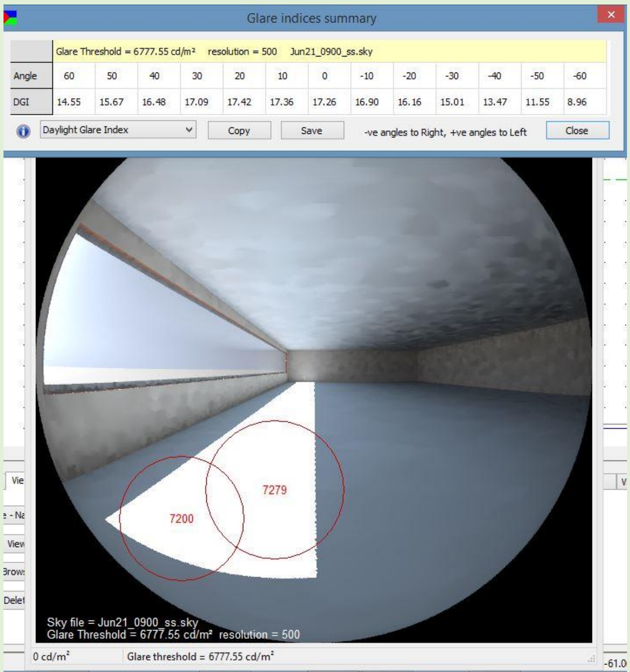
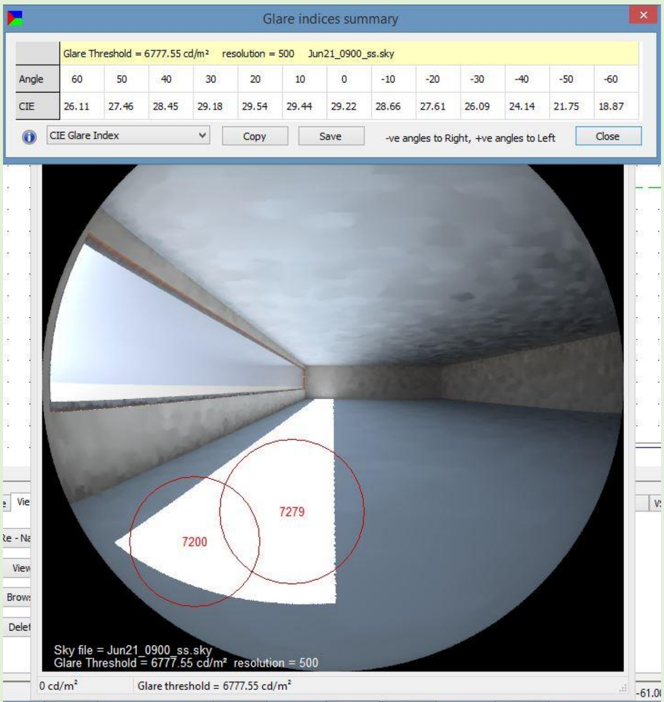
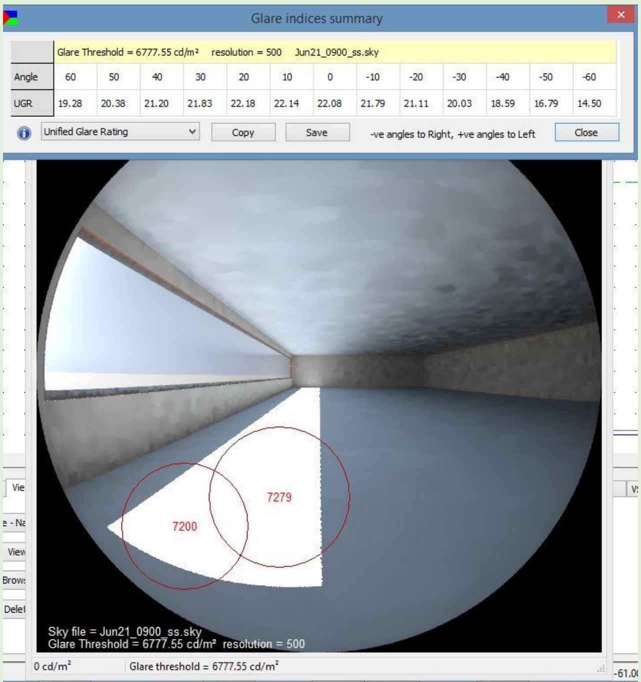
Angle	60	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
BRS	7.00	6.23	5.72	5.58	5.80	6.20	6.64	6.50	5.83	5.01	3.94	2.63	1.08

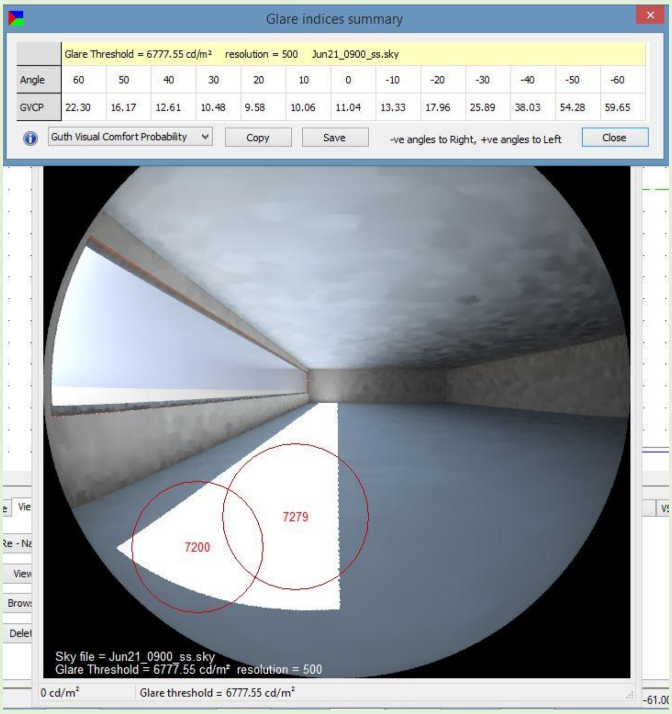
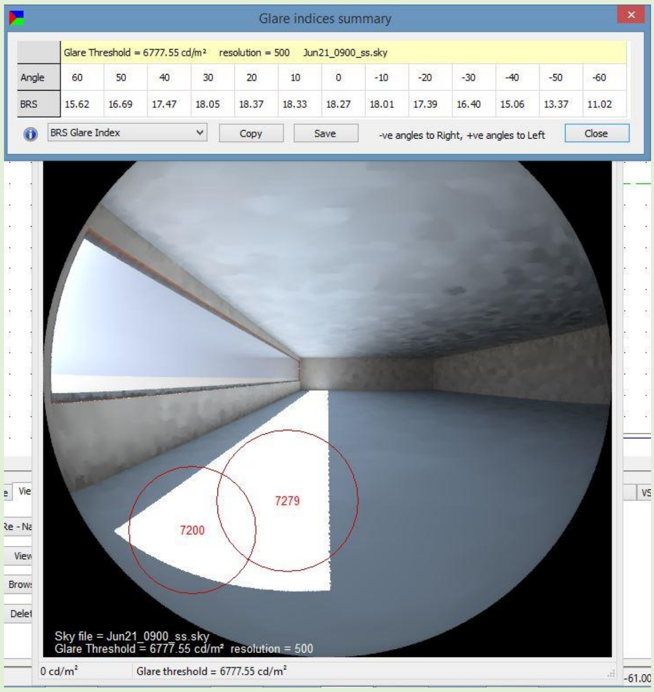
GDGR



Angle	60	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
GDGR	50.11	47.88	46.19	45.39	45.46	46.13	46.99	44.58	47.73	41.94	35.48	28.91	22.71

Table 185: Daylight and Glare Analysis for Jun 21, with sunny sky, (E), (P5/3m),(T9).

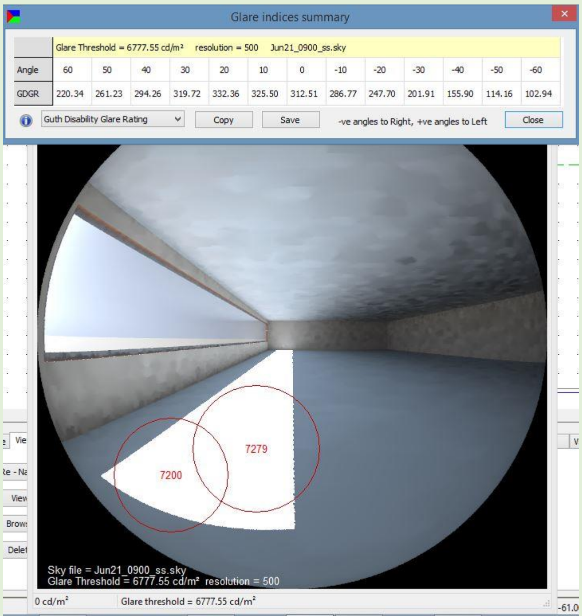
Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P5/3m) (T9).	
DGP	**DGI**
	
CGI	**UGR**
	

VCP	BRS
	

Glare indices summary
Glare Threshold = 6777.55 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 22.30 16.17 12.61 10.48 9.58 10.06 11.04 13.33 17.96 25.89 38.03 54.28 59.65
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
7279
7200
Sky file = Jun21_0900_ss.sky
Glare Threshold = 6777.55 cd/m² resolution = 500
0 cd/m²
Glare threshold = 6777.55 cd/m²

Glare indices summary
Glare Threshold = 6777.55 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 15.62 16.69 17.47 18.05 18.37 18.33 18.27 18.01 17.39 16.40 15.06 13.37 11.02
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
7279
7200
Sky file = Jun21_0900_ss.sky
Glare Threshold = 6777.55 cd/m² resolution = 500
0 cd/m²
Glare threshold = 6777.55 cd/m²

GDGR

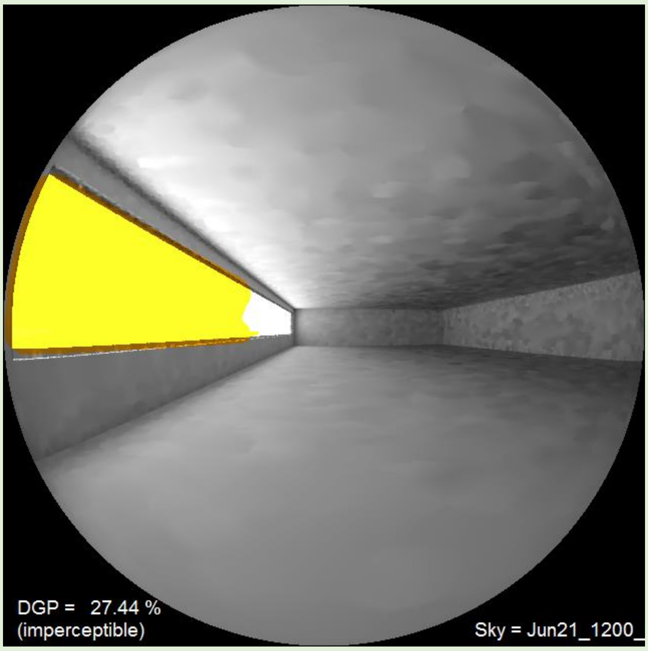


Glare indices summary
Glare Threshold = 6777.55 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 220.34 261.23 294.26 319.72 332.36 325.50 312.51 286.77 247.70 201.91 155.90 114.16 102.94
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
7279
7200
Sky file = Jun21_0900_ss.sky
Glare Threshold = 6777.55 cd/m² resolution = 500
0 cd/m²
Glare threshold = 6777.55 cd/m²

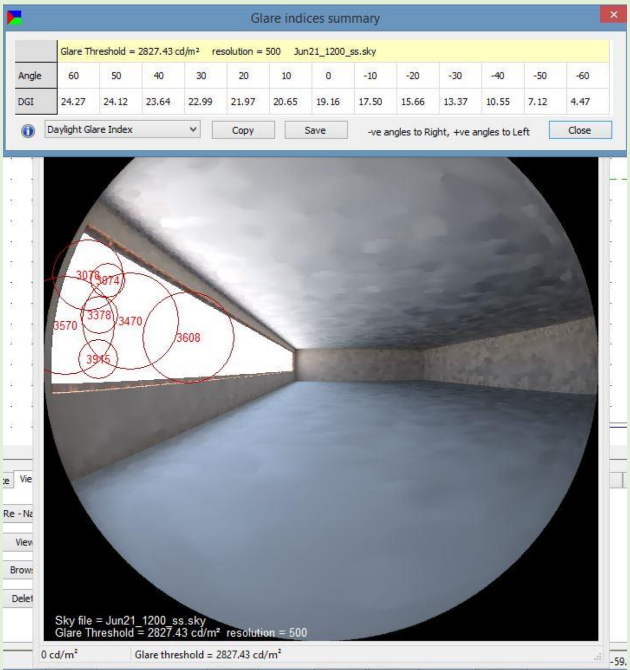
Table 186: Daylight and Glare Analysis for Jun 21, with sunny sky, (E), (P5/3m),(T12).

Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P5/3m) (T12).

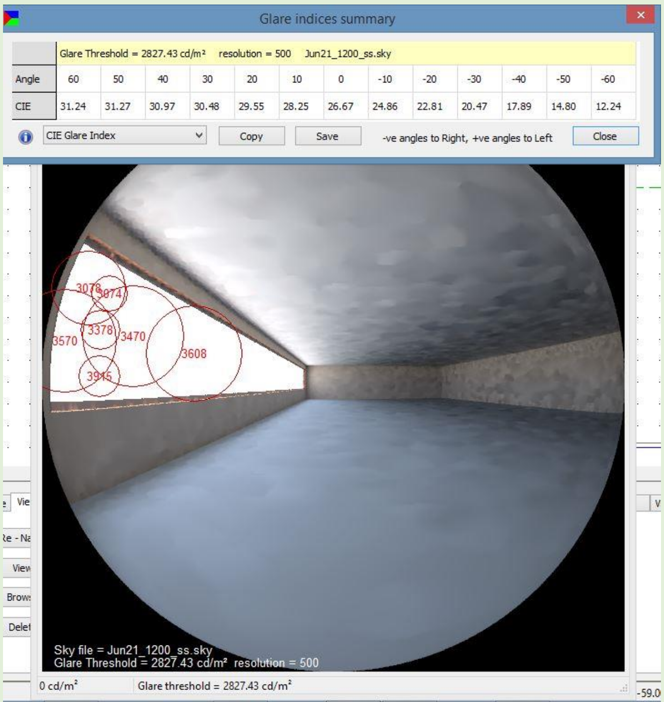
DGP



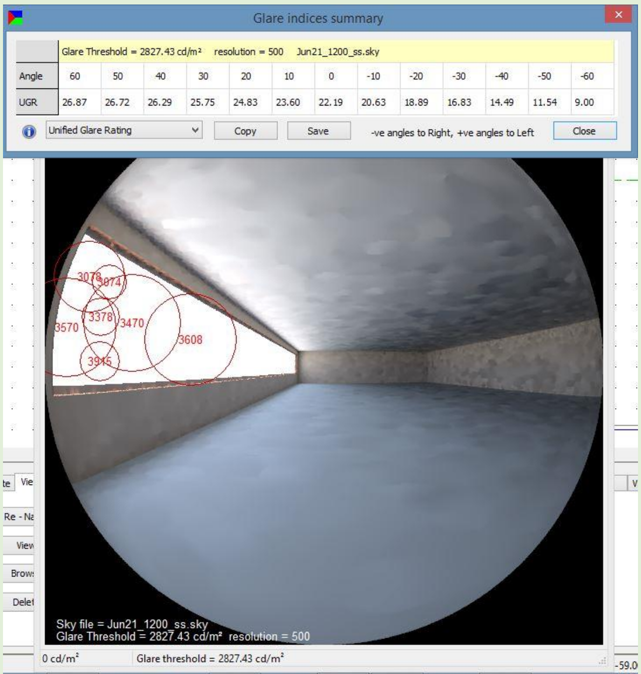
DGI



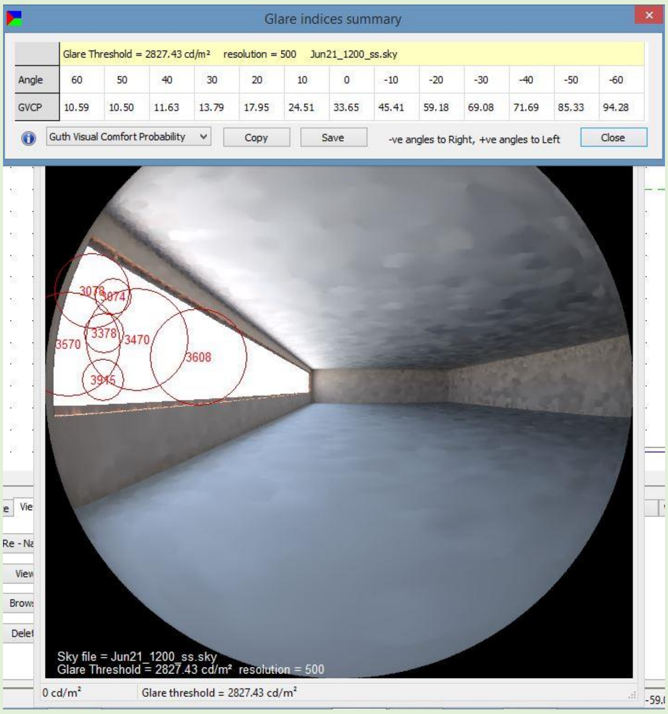
CGI



UGR

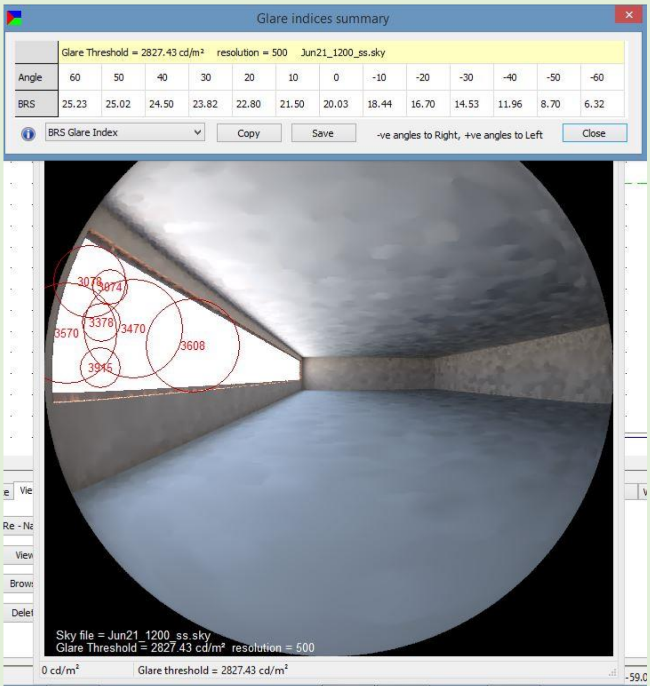


VCP



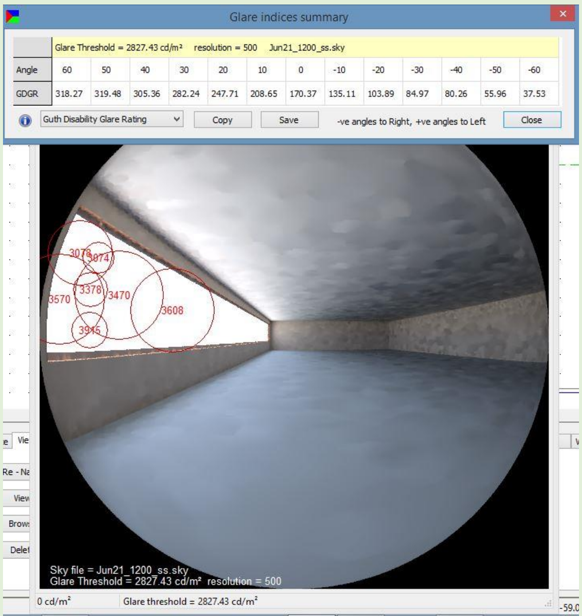
Glare indices summary
Glare Threshold = 2827.43 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 10.59 10.50 11.63 13.79 17.95 24.51 33.65 45.41 59.18 69.08 71.69 85.33 94.28
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_1200_ss.sky
Glare Threshold = 2827.43 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2827.43 cd/m²

BRS



Glare indices summary
Glare Threshold = 2827.43 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 25.23 25.02 24.50 23.82 22.80 21.50 20.03 18.44 16.70 14.53 11.96 8.70 6.32
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_1200_ss.sky
Glare Threshold = 2827.43 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2827.43 cd/m²

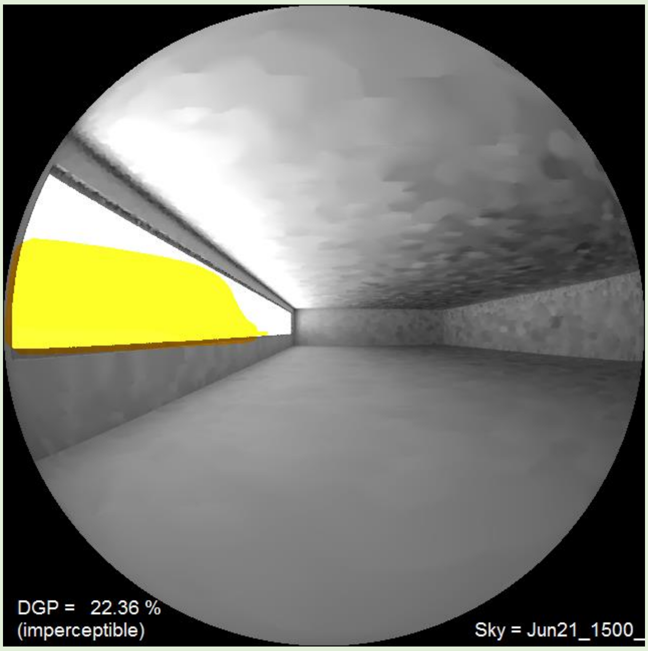
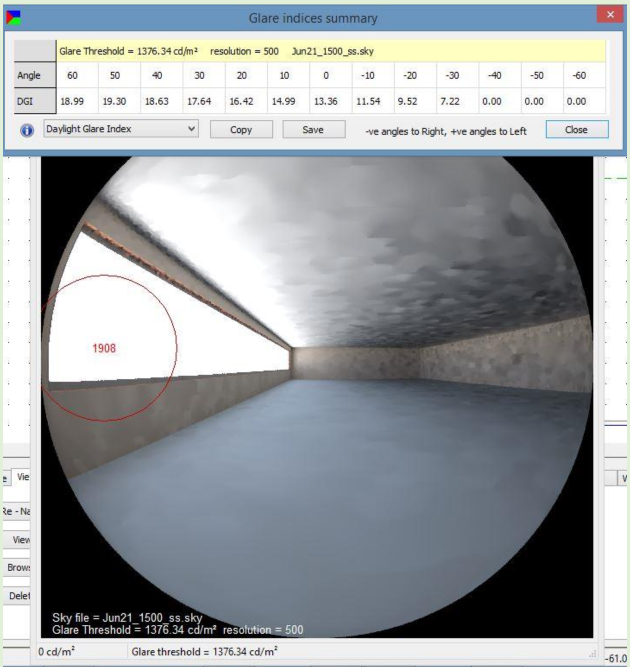
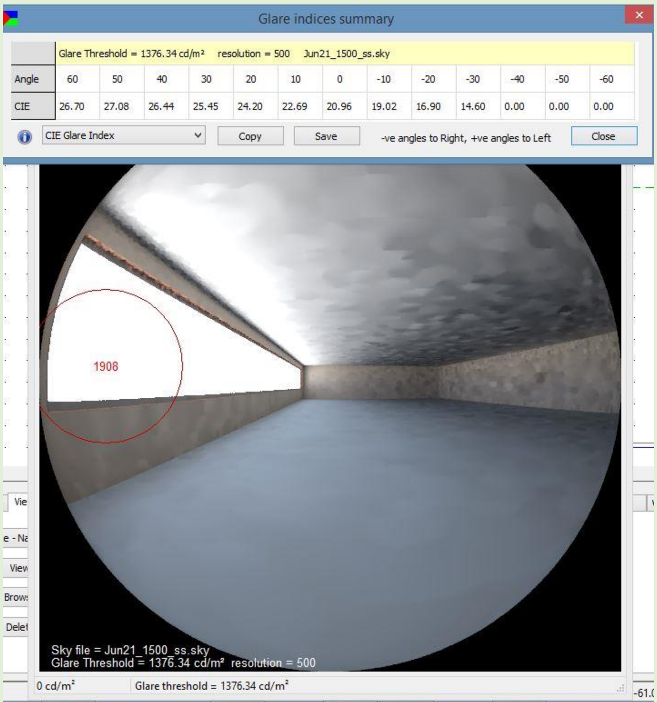
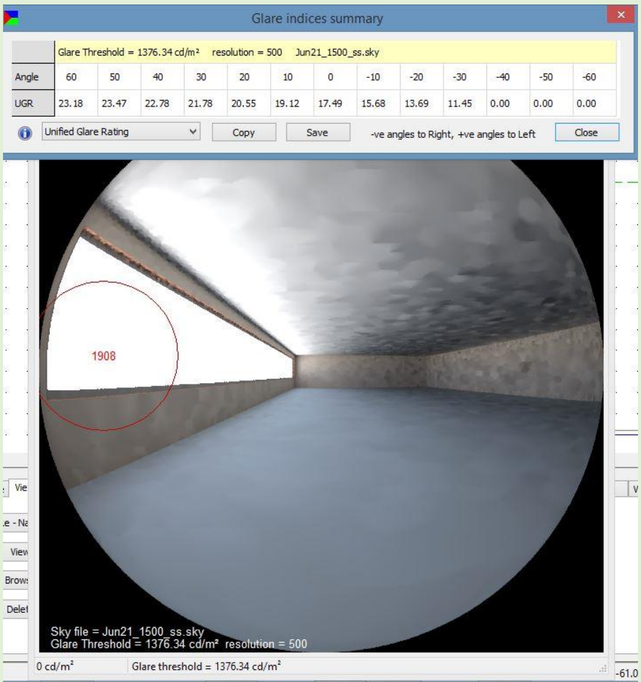
GDGR



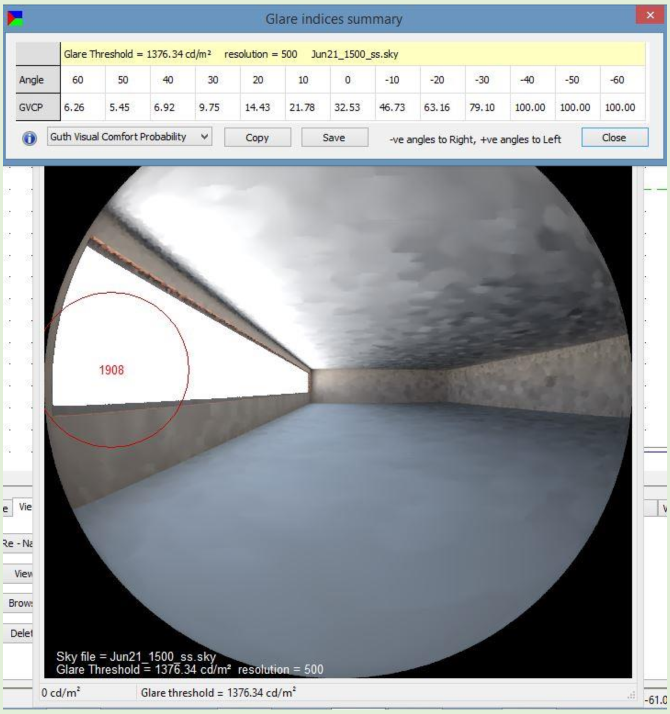
Glare indices summary
Glare Threshold = 2827.43 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 318.27 319.48 305.36 282.24 247.71 208.65 170.37 135.11 103.89 84.97 80.26 55.96 37.53
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_1200_ss.sky
Glare Threshold = 2827.43 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2827.43 cd/m²

Table 187: Daylight and Glare Analysis for Jun 21, with sunny sky, (E), (P5/3m),(T15).

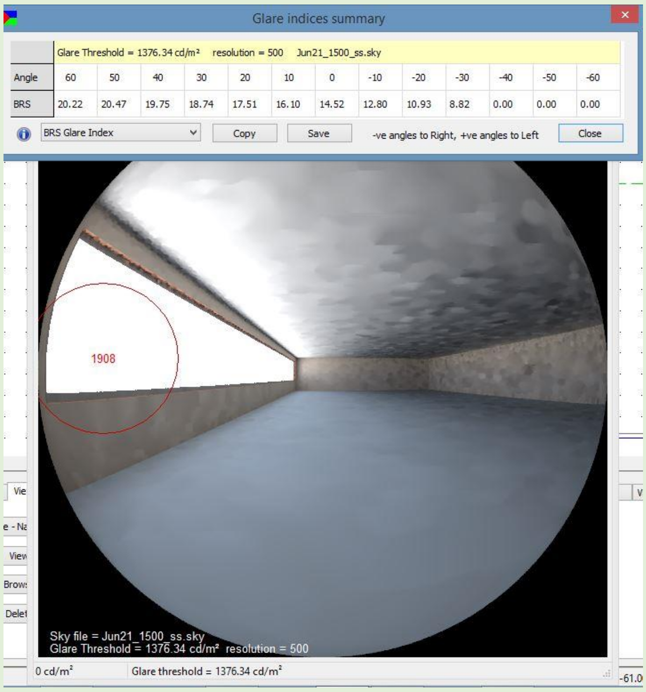
Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P5/3m) (T15).

DGP	DGI
	
CGI	**UGR**
	

VCP


Glare indices summary
Glare Threshold = 1376.34 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 6.26 5.45 6.92 9.75 14.43 21.78 32.53 46.73 63.16 79.10 100.00 100.00 100.00
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1908
Sky file = Jun21_1500_ss.sky
Glare Threshold = 1376.34 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1376.34 cd/m²

BRS


Glare indices summary
Glare Threshold = 1376.34 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 20.22 20.47 19.75 18.74 17.51 16.10 14.52 12.80 10.93 8.82 0.00 0.00 0.00
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1908
Sky file = Jun21_1500_ss.sky
Glare Threshold = 1376.34 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1376.34 cd/m²

GDGR

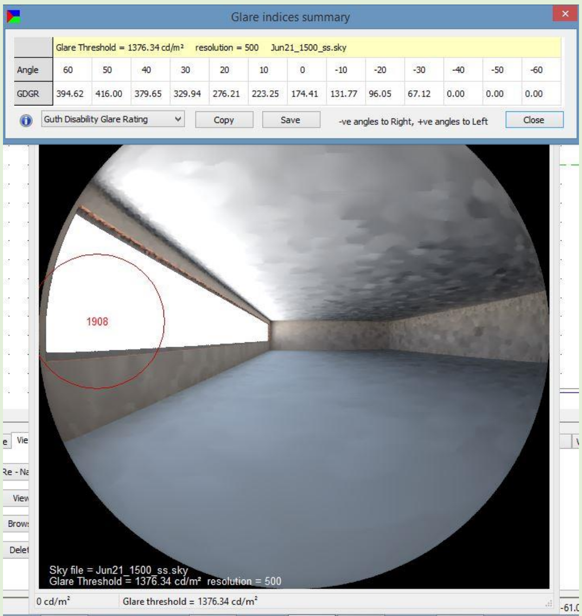
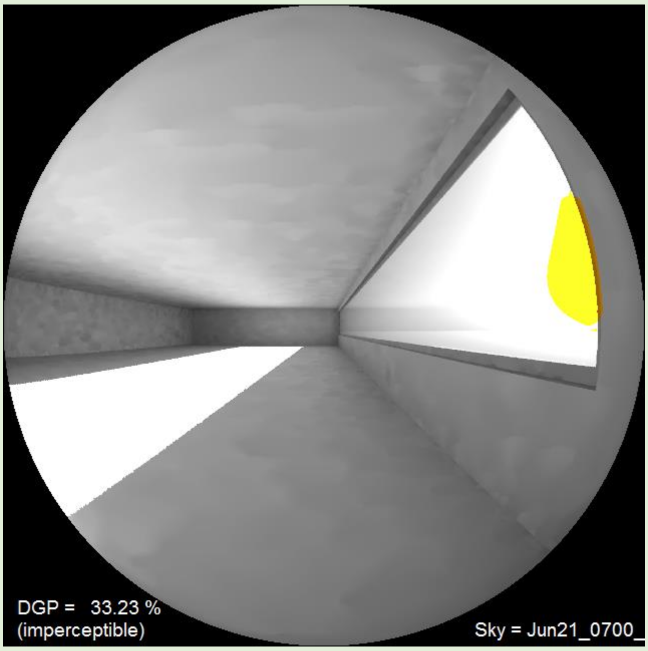

Glare indices summary
Glare Threshold = 1376.34 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 394.62 416.00 379.65 329.94 276.21 223.25 174.41 131.77 96.05 67.12 0.00 0.00 0.00
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1908
Sky file = Jun21_1500_ss.sky
Glare Threshold = 1376.34 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1376.34 cd/m²

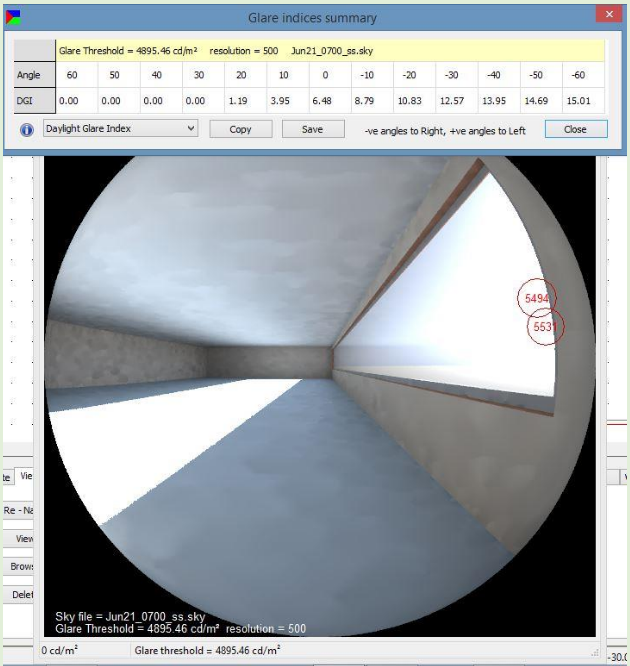
Table 188: Daylight and Glare Analysis for Jun 21, with sunny sky, (E), (P6/1.5m),(T7).

Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P6/1.5m) (T7).

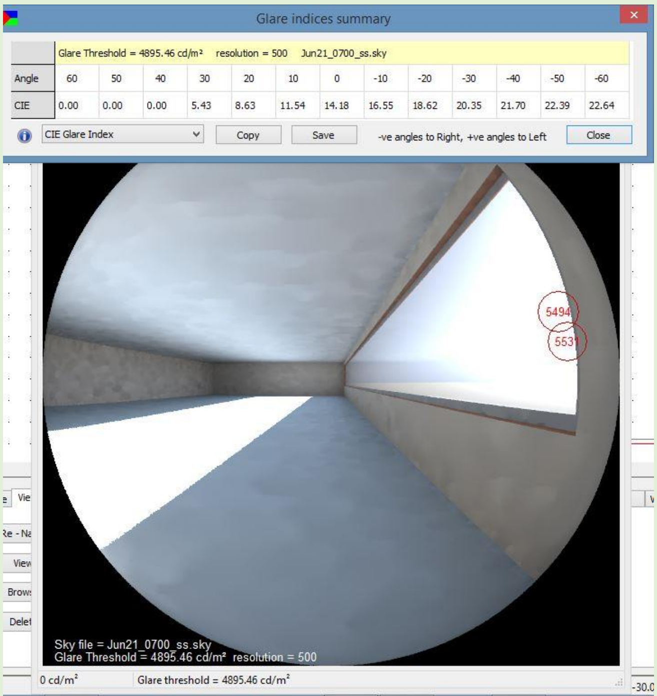
DGP



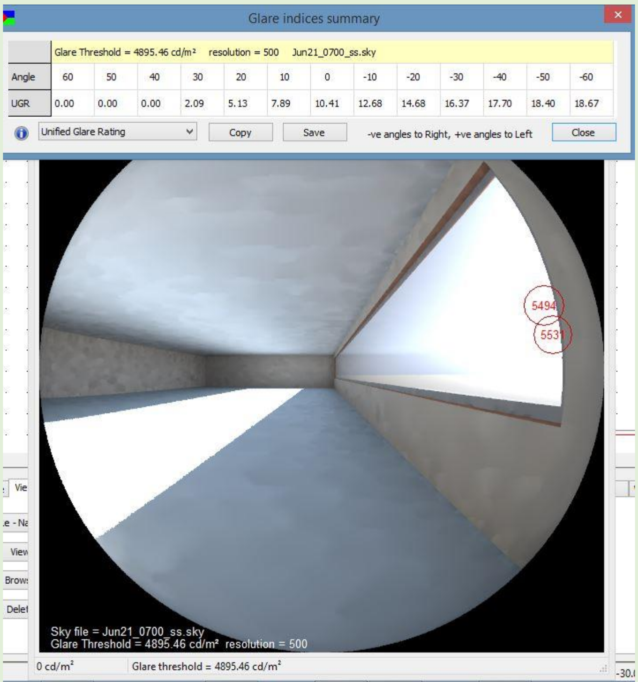
DGI

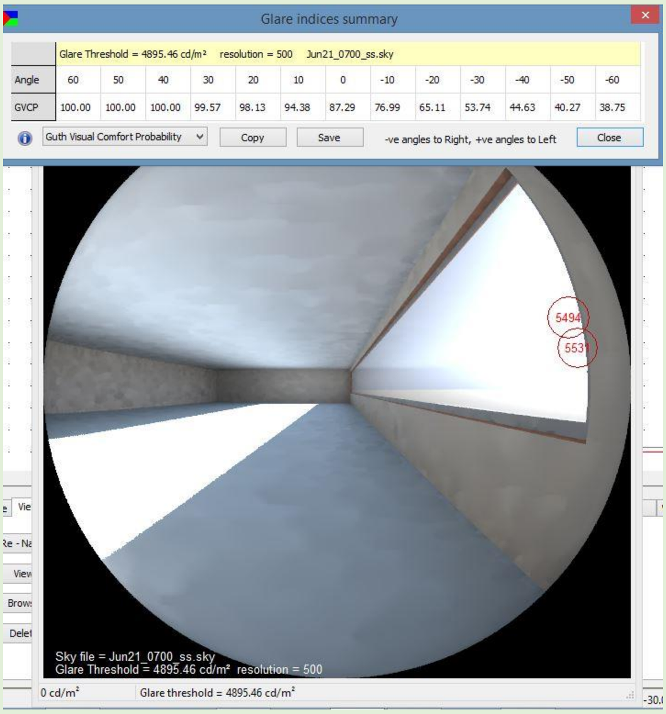
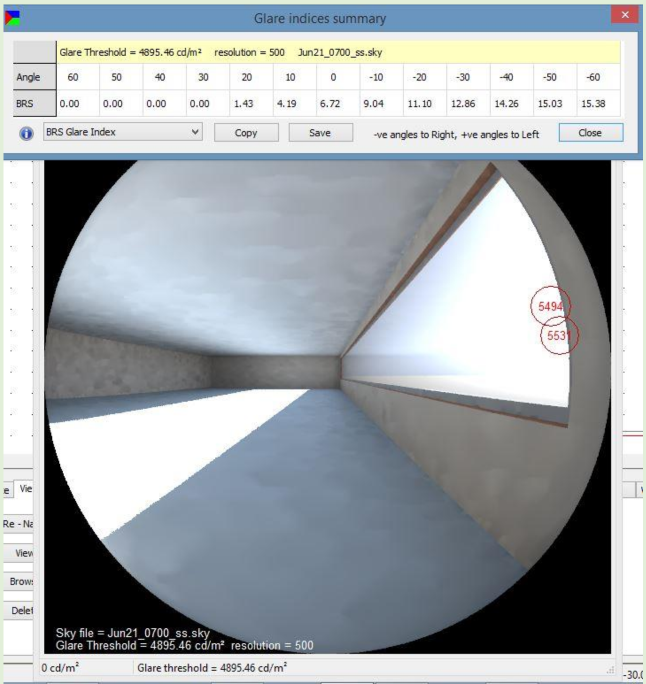


CGI



UGR

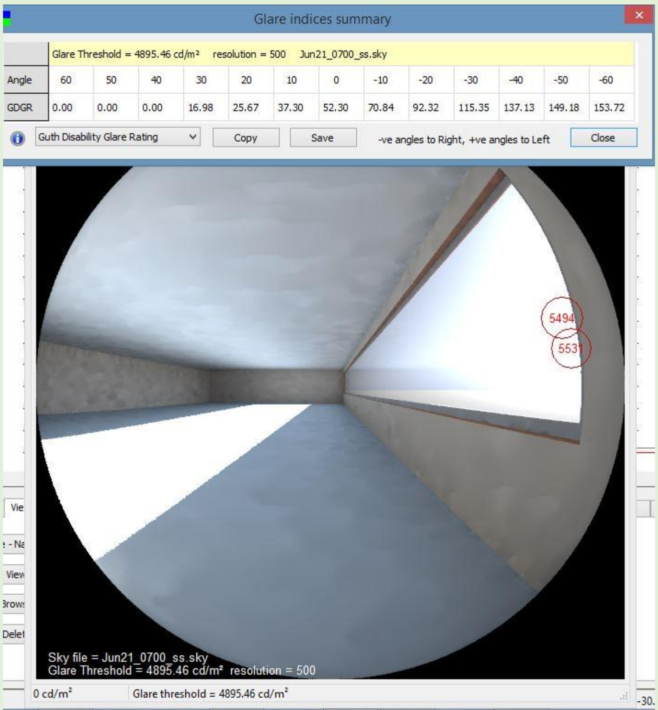


VCP	BRS
	

Glare indices summary
Glare Threshold = 4895.46 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 100.00 100.00 100.00 99.57 98.13 94.38 87.29 76.99 65.11 53.74 44.63 40.27 38.75
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
5494
5531
Sky file = Jun21_0700_ss.sky
Glare Threshold = 4895.46 cd/m² resolution = 500
0 cd/m²
Glare threshold = 4895.46 cd/m²

Glare indices summary
Glare Threshold = 4895.46 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 0.00 0.00 0.00 0.00 1.43 4.19 6.72 9.04 11.10 12.86 14.26 15.03 15.38
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
5494
5531
Sky file = Jun21_0700_ss.sky
Glare Threshold = 4895.46 cd/m² resolution = 500
0 cd/m²
Glare threshold = 4895.46 cd/m²

GDGR



Glare indices summary
Glare Threshold = 4895.46 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 0.00 0.00 0.00 16.98 25.67 37.30 52.30 70.84 92.32 115.35 137.13 149.18 153.72
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
5494
5531
Sky file = Jun21_0700_ss.sky
Glare Threshold = 4895.46 cd/m² resolution = 500
0 cd/m²
Glare threshold = 4895.46 cd/m²

Table 189: Daylight and Glare Analysis for Jun 21, with sunny sky, (E), (P6/1.5m),(T9).

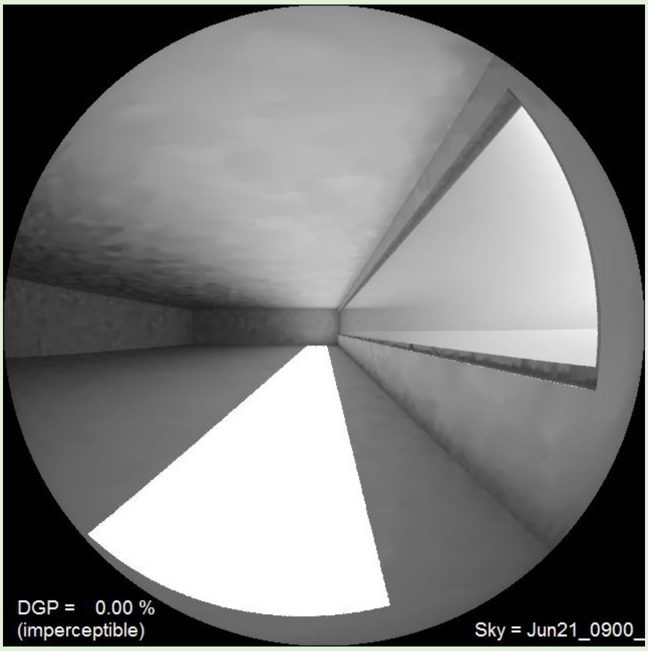
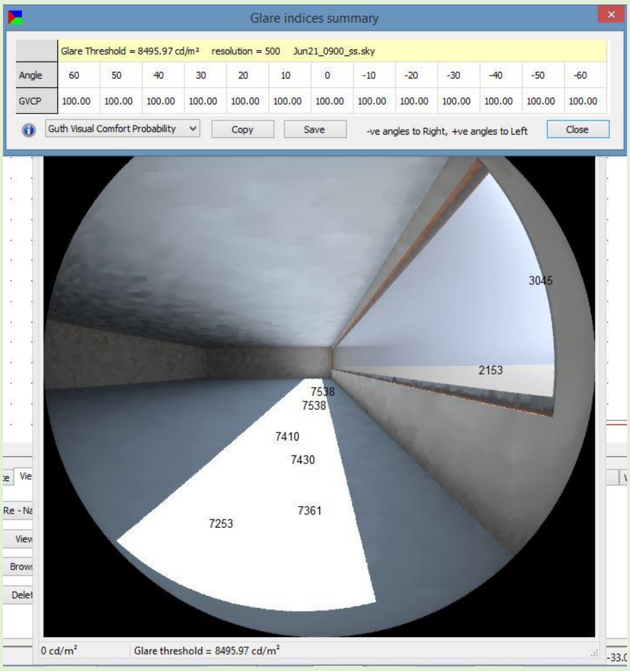
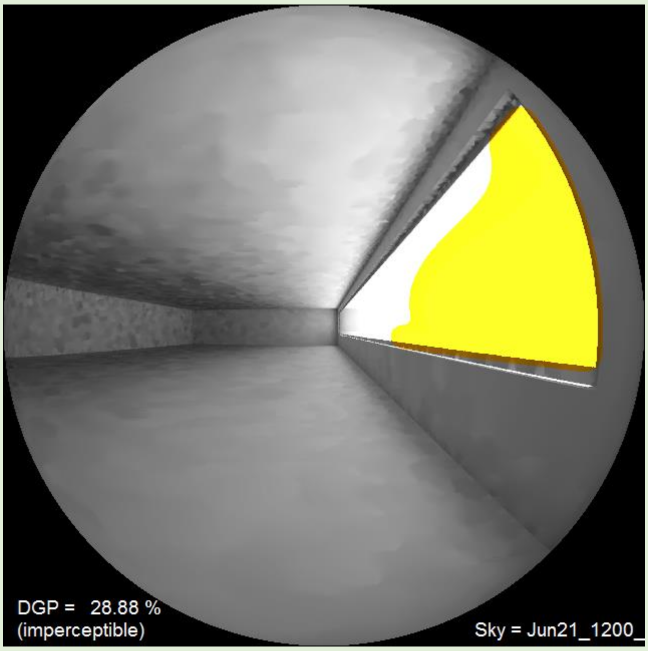
<table>
<tr><th colspan="2">Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P6/1.5m) (T9).</th></tr>
<tr><th>DGP</th><th>VCP</th></tr>
<tr><td>
</td><td>
</td></tr>
</table>

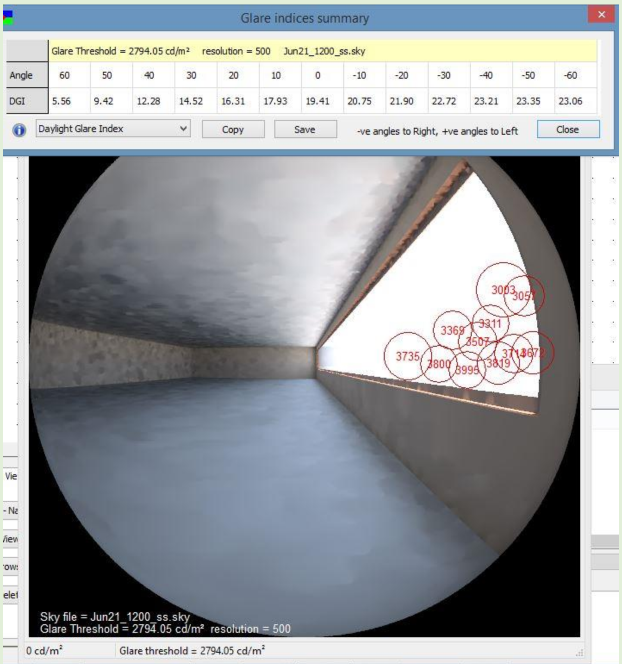
Table 190: Daylight and Glare Analysis for Jun 21, with sunny sky, (E), (P6/1.5m),(T12).

Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P6/1.5m) (T12).

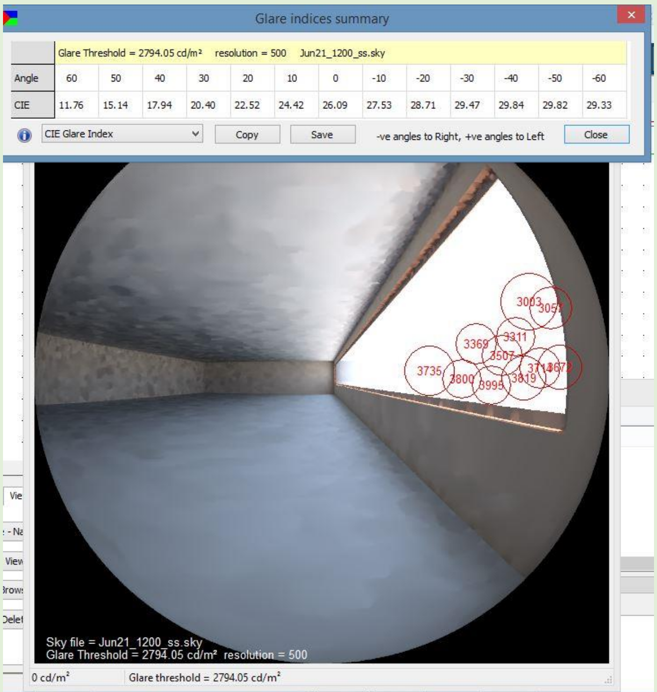
DGP



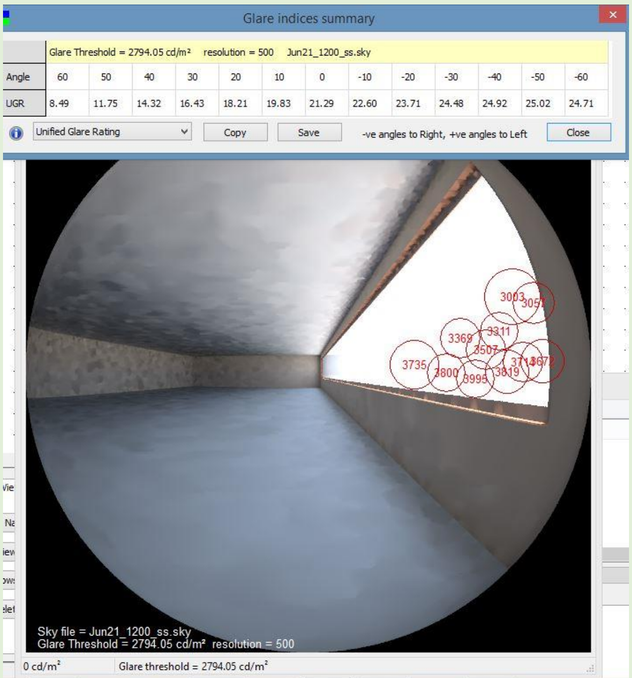
DGI

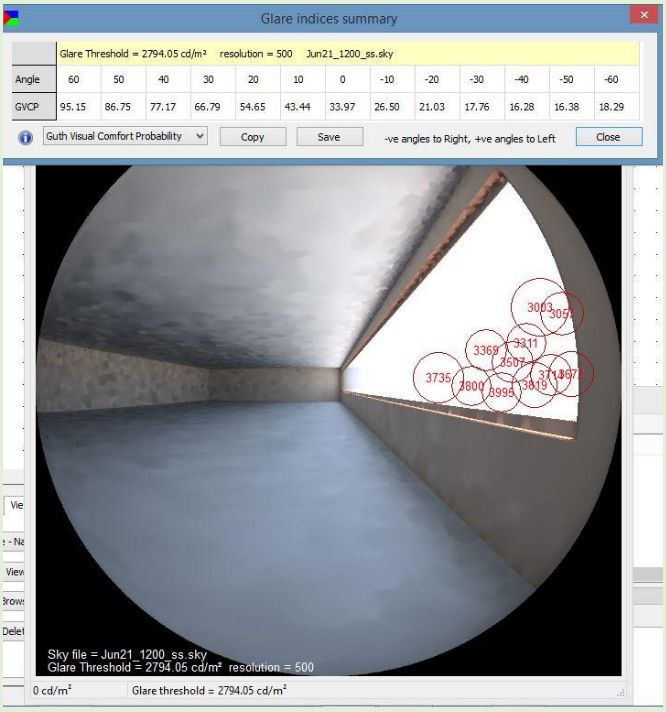
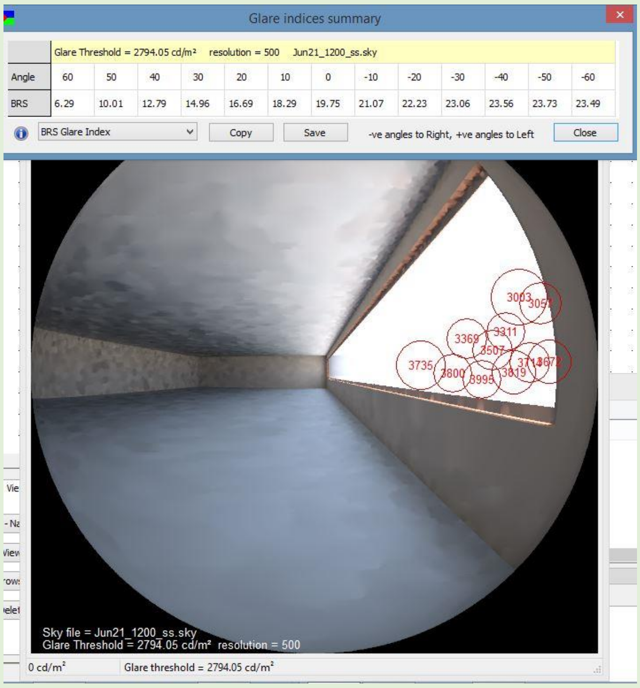


CGI



UGR

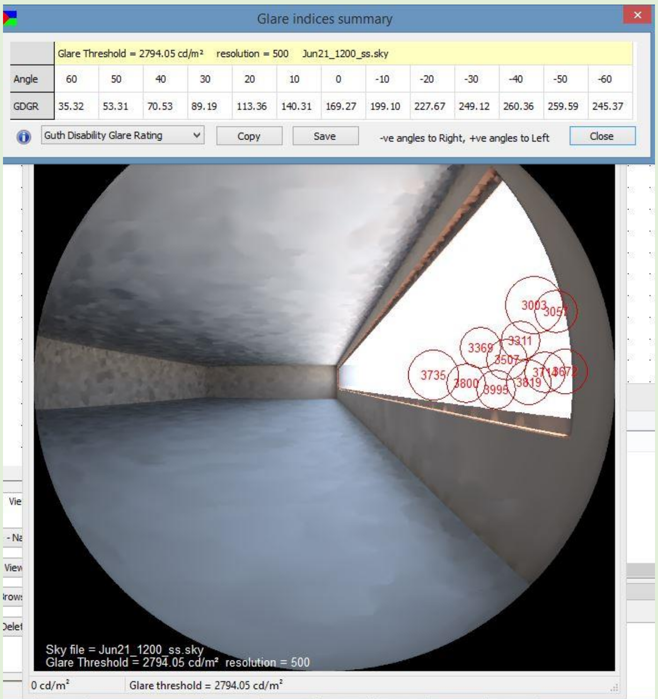


VCP	BRS
	

Glare indices summary
Glare Threshold = 2794.05 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 95.15 86.75 77.17 66.79 54.65 43.44 33.97 26.50 21.03 17.76 16.28 16.38 18.29
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_1200_ss.sky
Glare Threshold = 2794.05 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2794.05 cd/m²

Glare indices summary
Glare Threshold = 2794.05 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 6.29 10.01 12.79 14.96 16.69 18.29 19.75 21.07 22.23 23.06 23.56 23.73 23.49
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_1200_ss.sky
Glare Threshold = 2794.05 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2794.05 cd/m²

GDGR

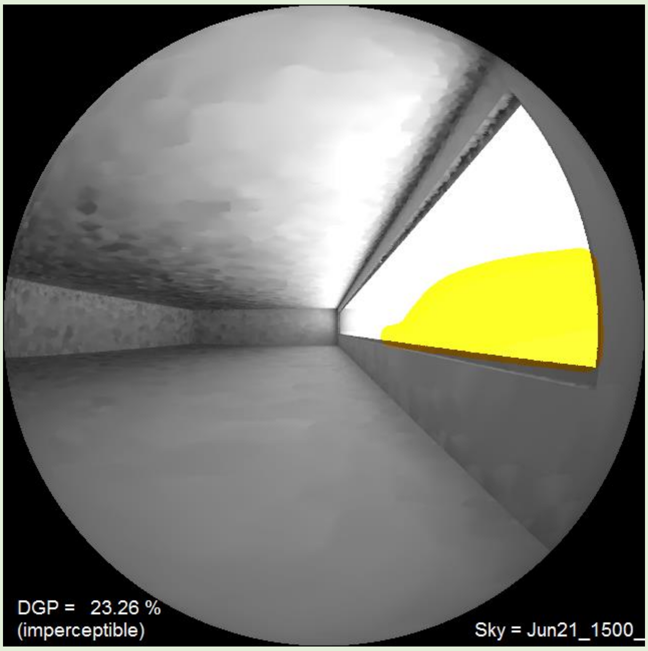


Glare indices summary
Glare Threshold = 2794.05 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 35.32 53.31 70.53 89.19 113.36 140.31 169.27 199.10 227.67 249.12 260.36 259.59 245.37
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_1200_ss.sky
Glare Threshold = 2794.05 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2794.05 cd/m²

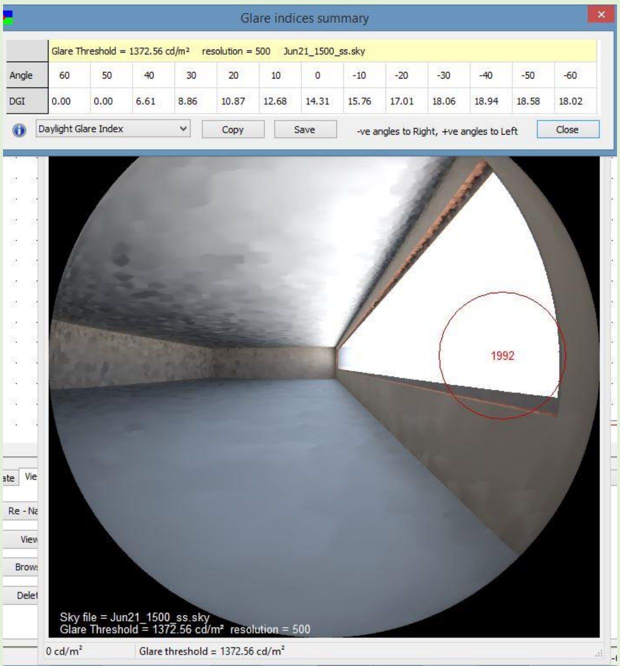
Table 191: Daylight and Glare Analysis for Jun 21, with sunny sky, (E), (P6/1.5m),(T15).

Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P6/1.5m) (T15).

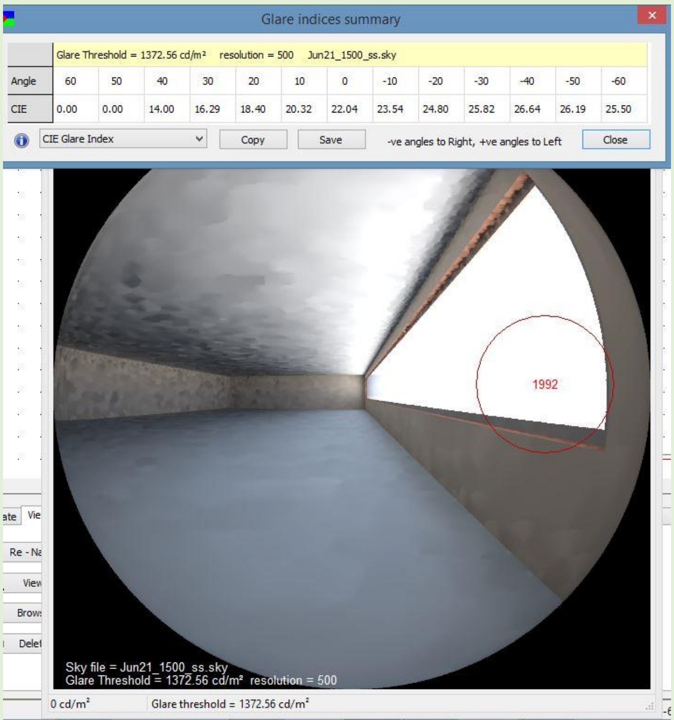
DGP



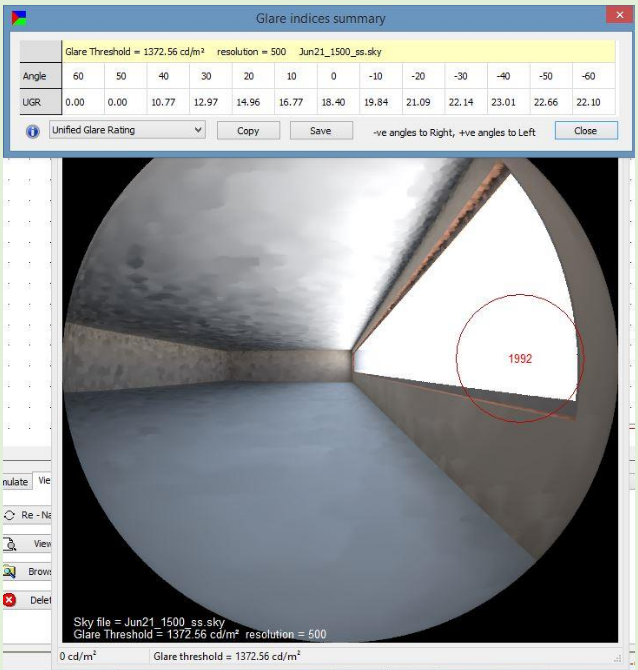
DGI

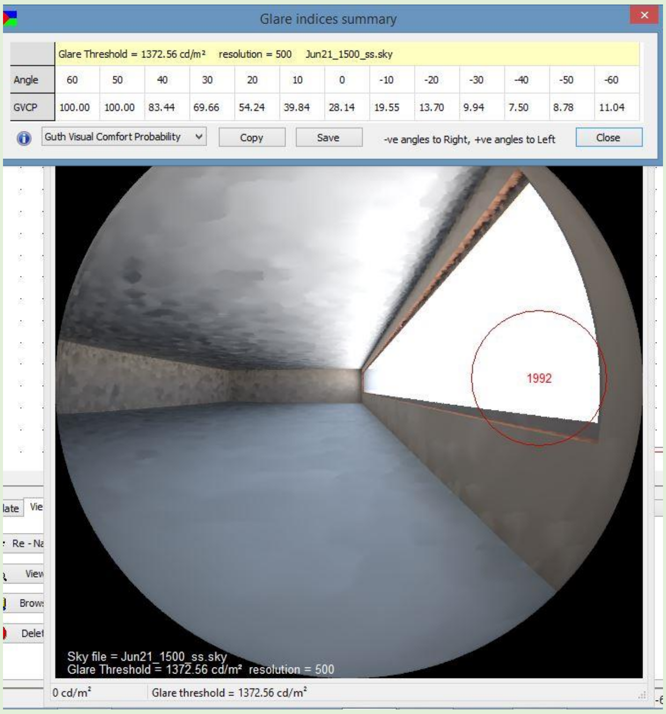
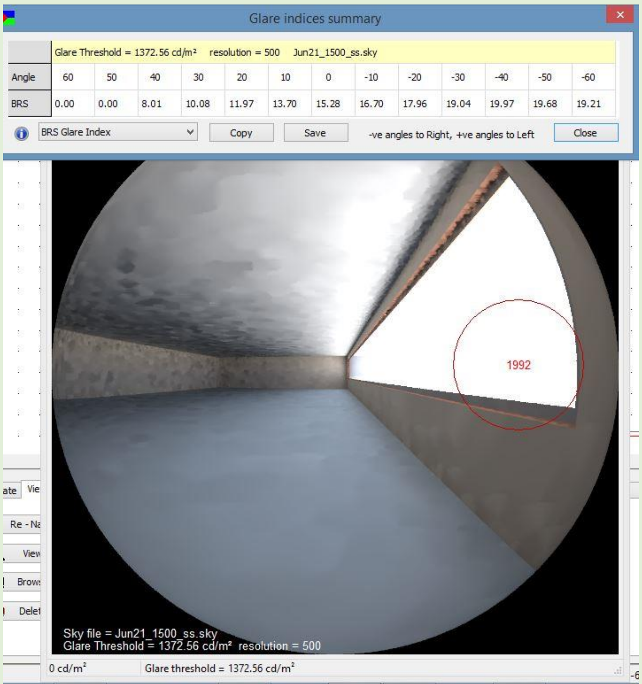


CGI



UGR

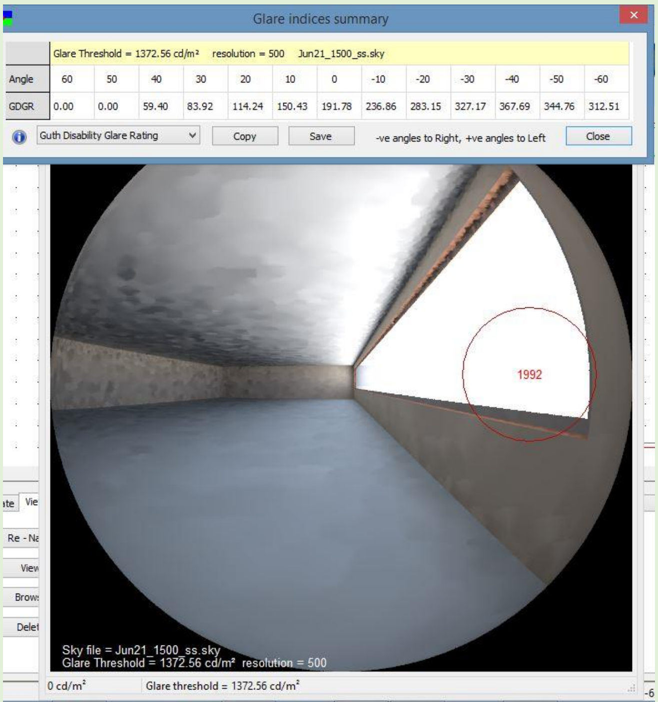


VCP	BRS
	

Angle	60	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
GVCP	100.00	100.00	83.44	69.66	54.24	39.84	28.14	19.55	13.70	9.94	7.50	8.78	11.04

Angle	60	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
BRS	0.00	0.00	8.01	10.08	11.97	13.70	15.28	16.70	17.96	19.04	19.97	19.68	19.21

GDGR



Angle	60	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
GDGR	0.00	0.00	59.40	83.92	114.24	150.43	191.78	236.86	283.15	327.17	367.69	344.76	312.51

Table 192: Daylight and Glare Analysis for Jun 21, with sunny sky, (E), (P6/3m),(T7).

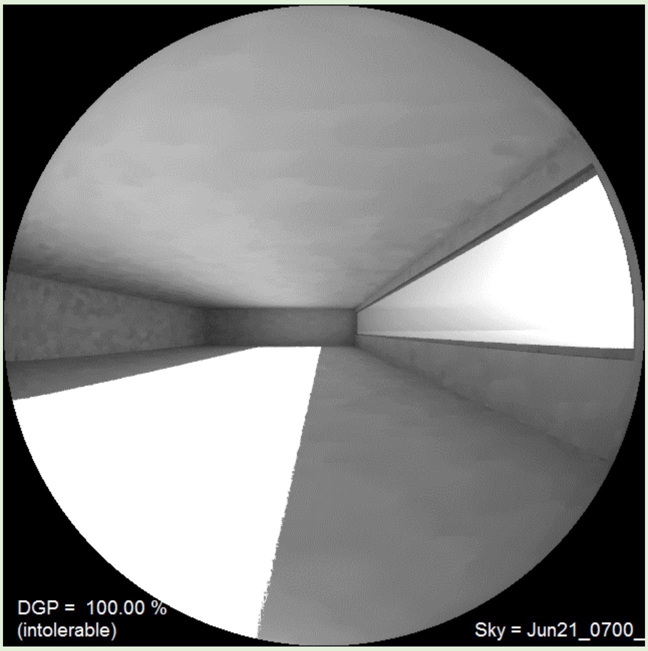
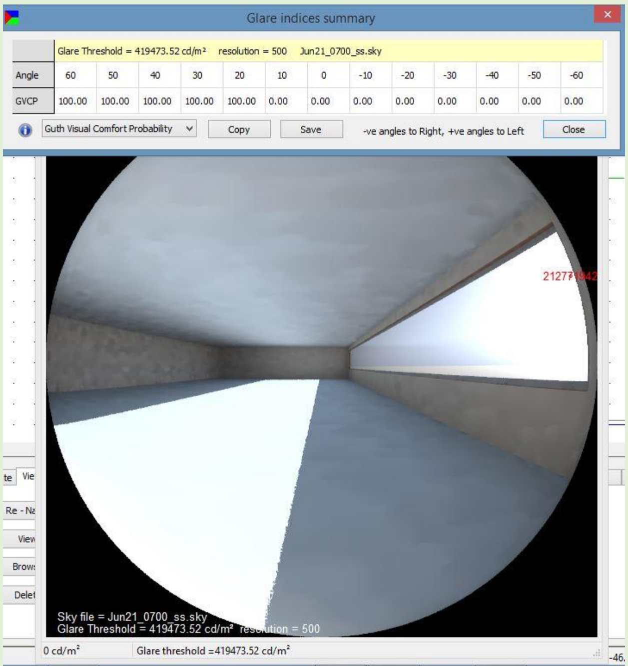
Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P6/3m) (T7).	
DGP	**VCP**
	

Table 193: Daylight and Glare Analysis for Jun 21, with sunny sky, (E), (P6/3m),(T9).

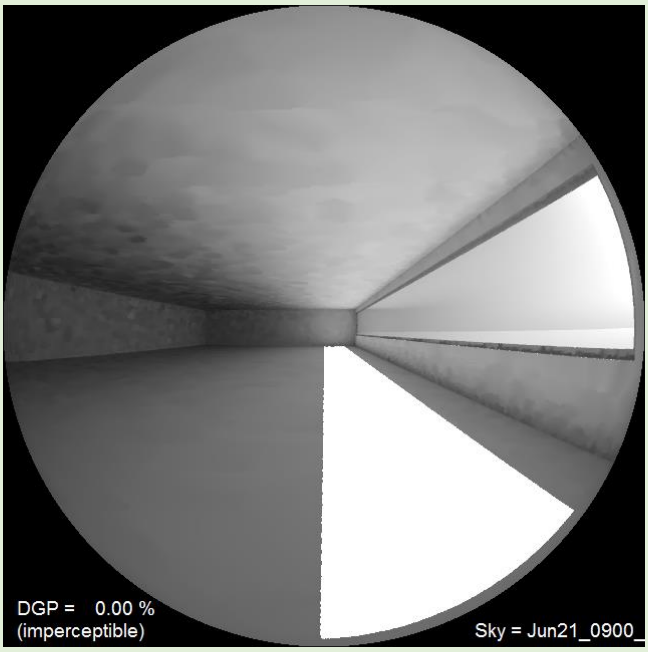
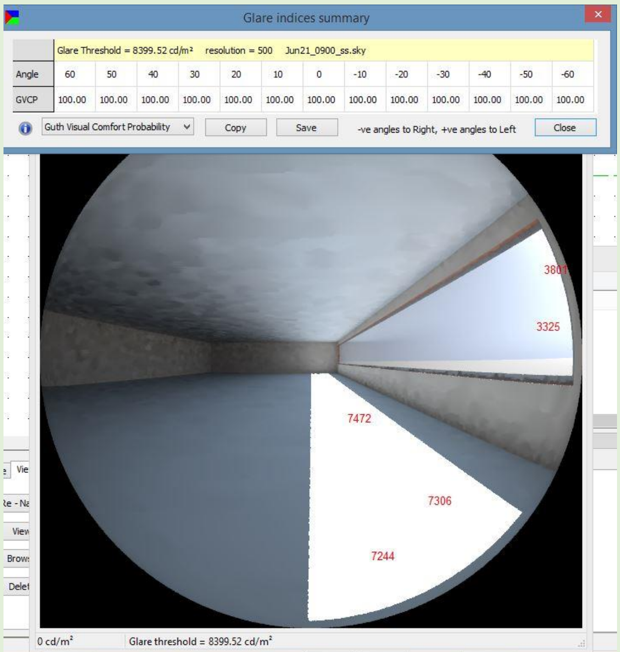
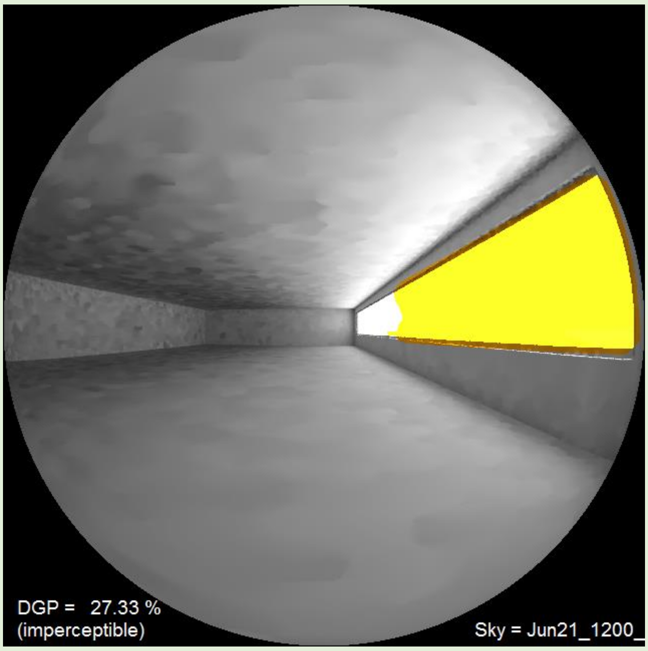
Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P6/3m) (T9).	
DGP	**VCP**
	

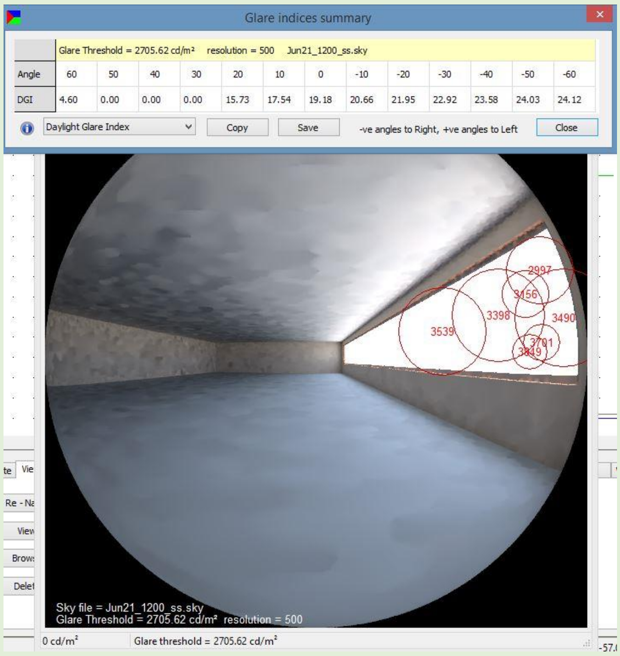
Table 194: Daylight and Glare Analysis for Jun 21, with sunny sky, (E), (P6/3m),(T12).

Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P6/3m) (T12).

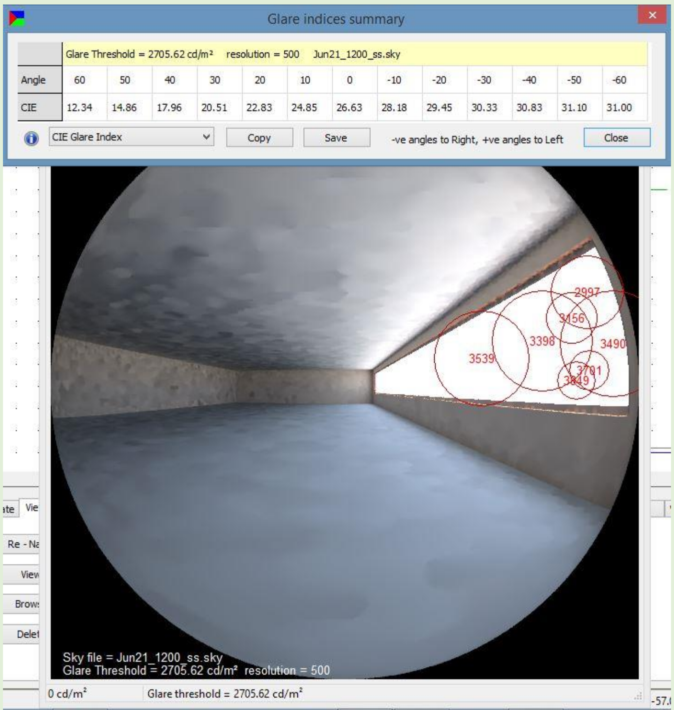
DGP



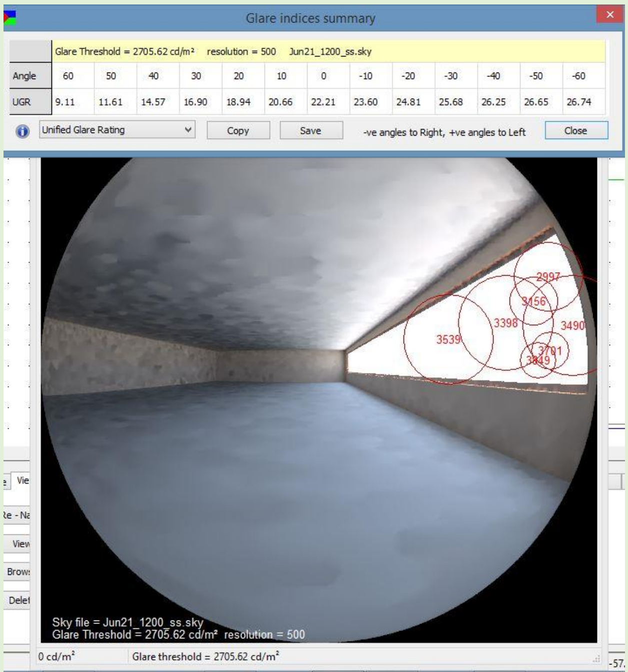
DGI

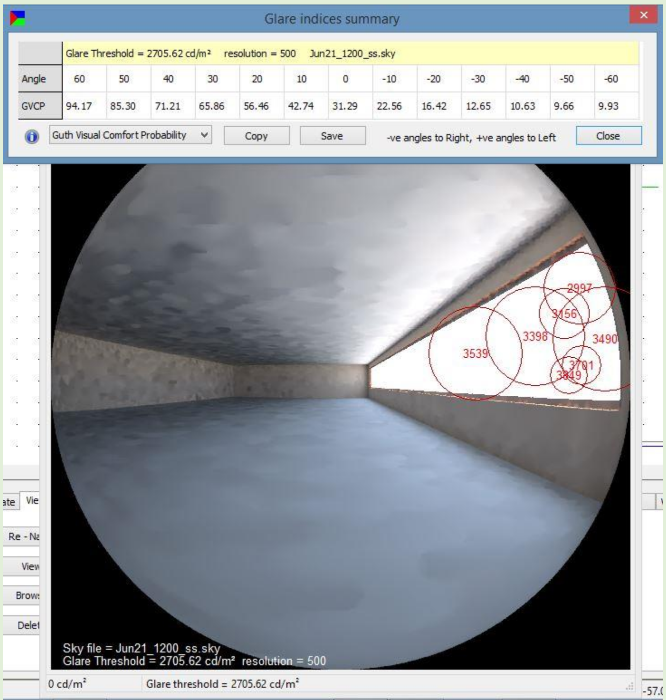
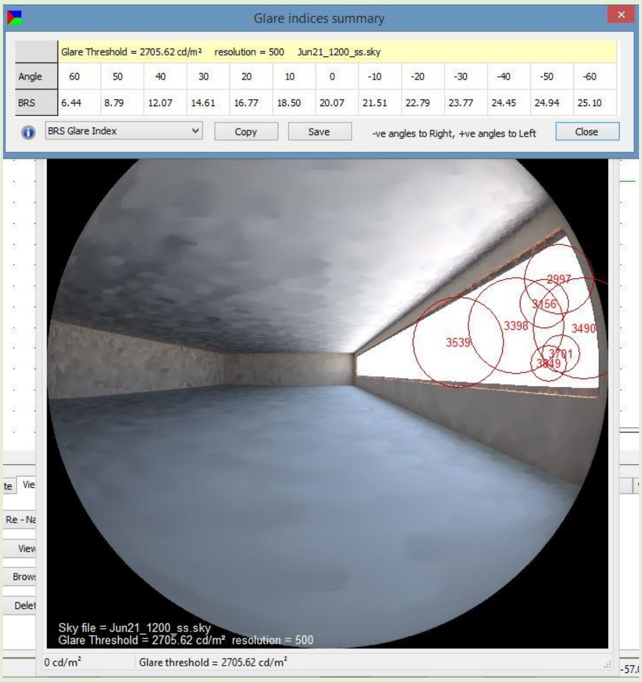


CGI



UGR

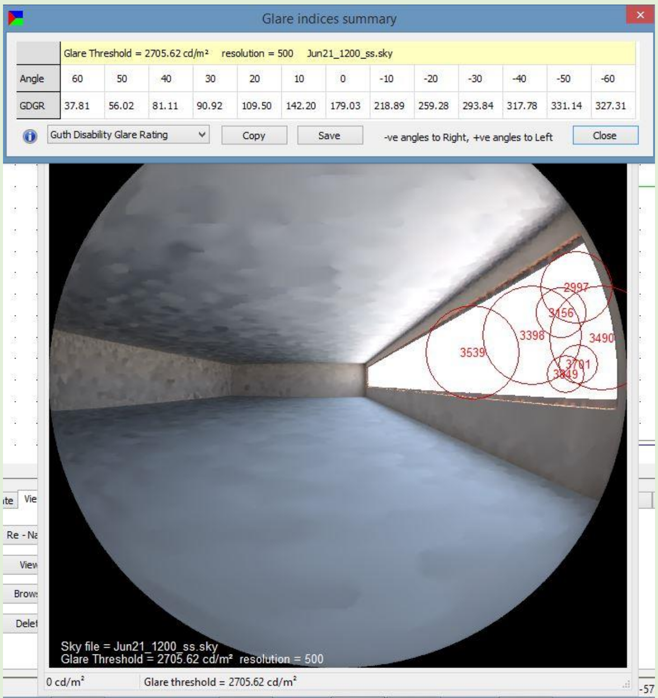


VCP	BRS
	

Glare indices summary
Glare Threshold = 2705.62 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 94.17 85.30 71.21 65.86 56.46 42.74 31.29 22.56 16.42 12.65 10.63 9.66 9.93
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_1200_ss.sky
Glare Threshold = 2705.62 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2705.62 cd/m²

Glare indices summary
Glare Threshold = 2705.62 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 6.44 8.79 12.07 14.61 16.77 18.50 20.07 21.51 22.79 23.77 24.45 24.94 25.10
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_1200_ss.sky
Glare Threshold = 2705.62 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2705.62 cd/m²

GDGR

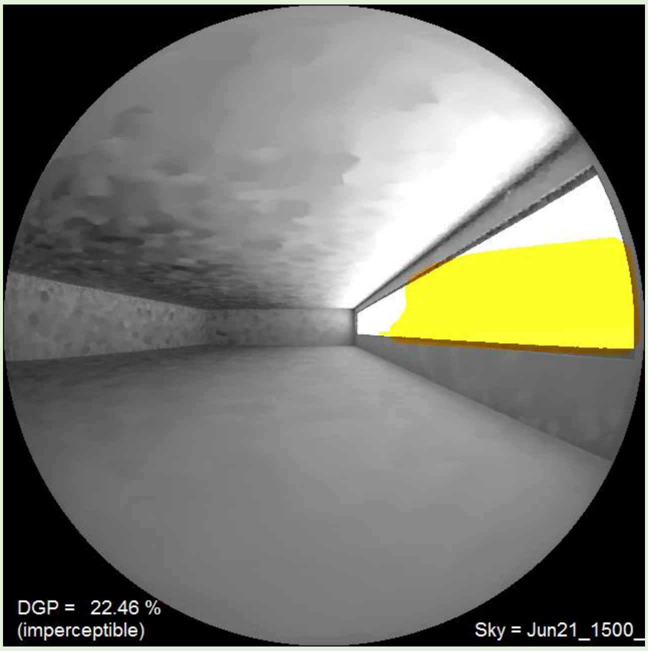


Glare indices summary
Glare Threshold = 2705.62 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 37.81 56.02 81.11 90.92 109.50 142.20 179.03 218.89 259.28 293.84 317.78 331.14 327.31
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_1200_ss.sky
Glare Threshold = 2705.62 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2705.62 cd/m²

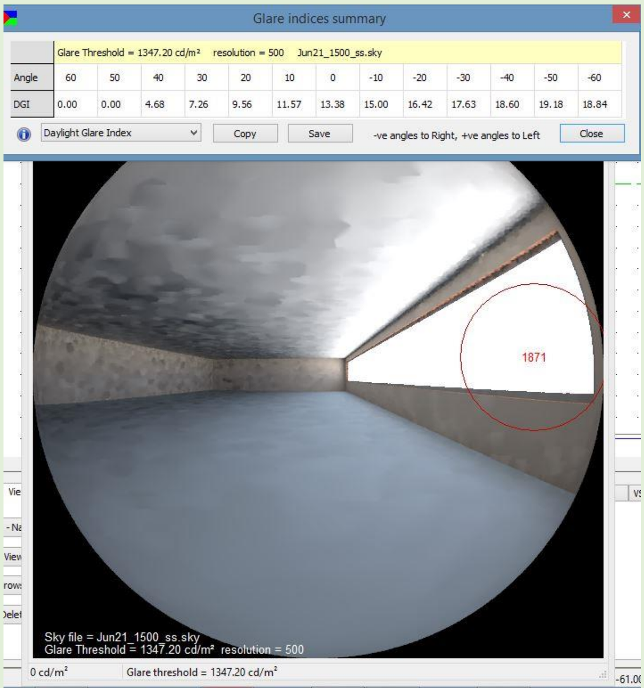
Table 195: Daylight and Glare Analysis for Jun 21, with sunny sky, (E), (P6/3m),(T15).

Daylight and Glare Analysis for Jun 21, (sunny sky), (E), (P6/3m) (T15).

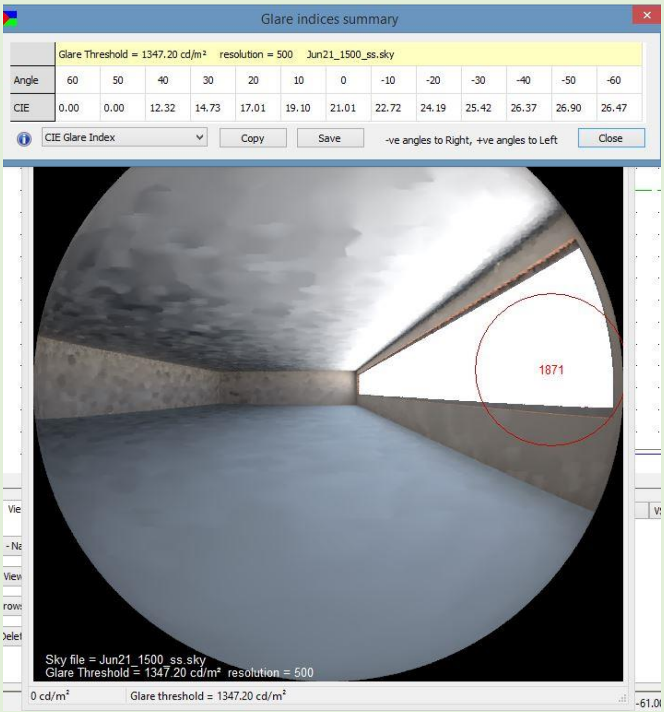
DGP



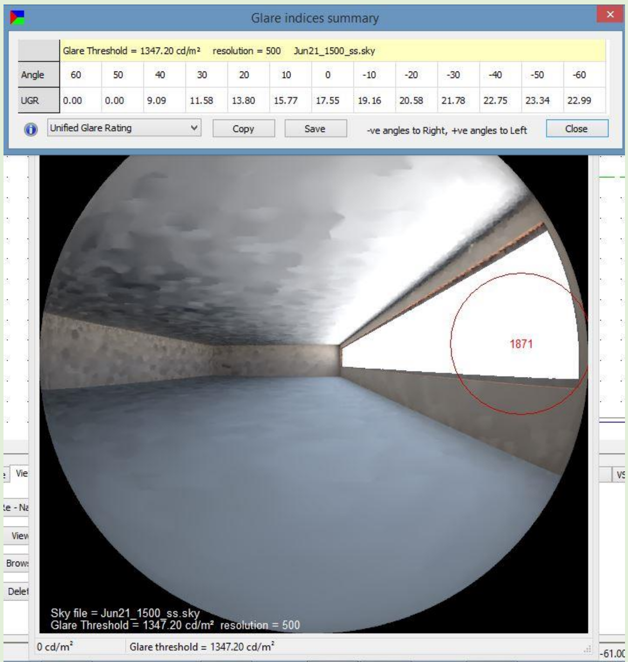
DGI



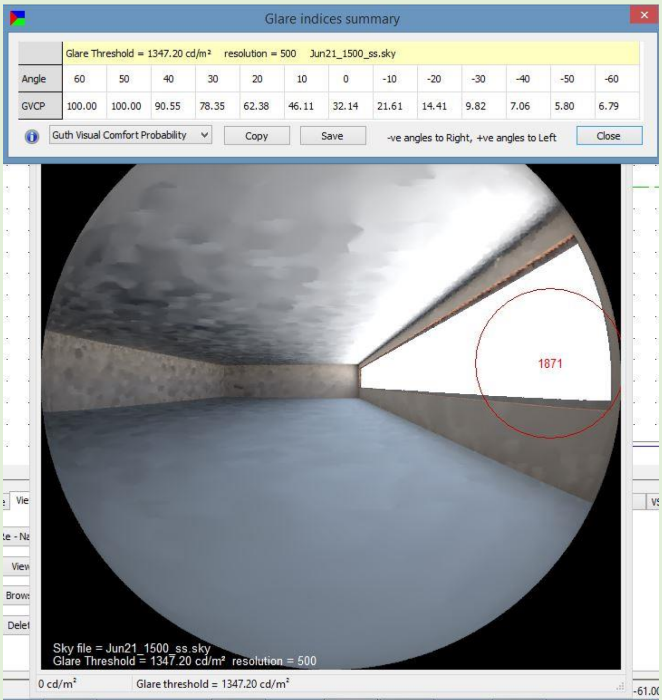
CGI



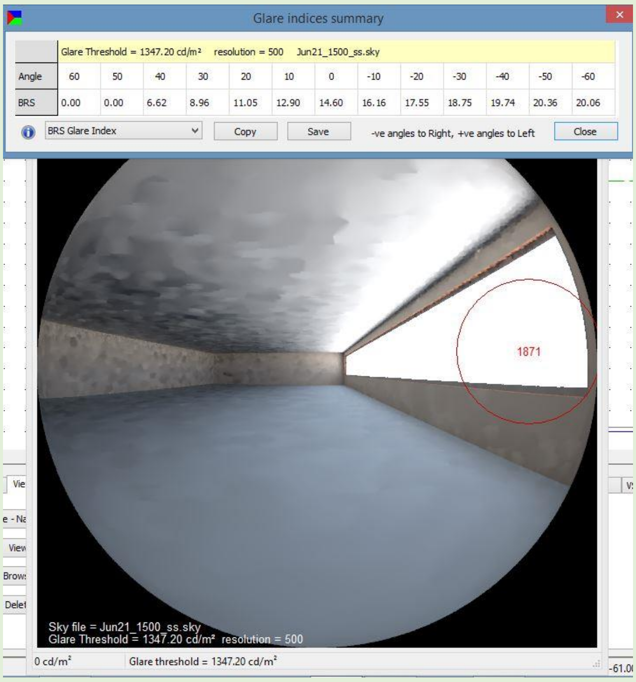
UGR



VCP


Glare indices summary
Glare Threshold = 1347.20 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 100.00 100.00 90.55 78.35 62.38 46.11 32.14 21.61 14.41 9.82 7.06 5.80 6.79
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1871
Sky file = Jun21_1500_ss.sky
Glare Threshold = 1347.20 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1347.20 cd/m²

BRS


Glare indices summary
Glare Threshold = 1347.20 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 0.00 0.00 6.62 8.96 11.05 12.90 14.60 16.16 17.55 18.75 19.74 20.36 20.06
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1871
Sky file = Jun21_1500_ss.sky
Glare Threshold = 1347.20 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1347.20 cd/m²

GDGR

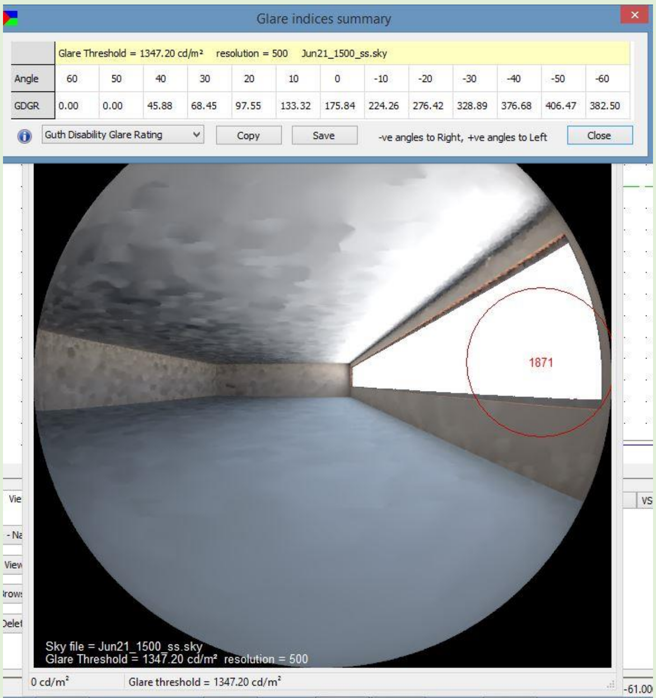
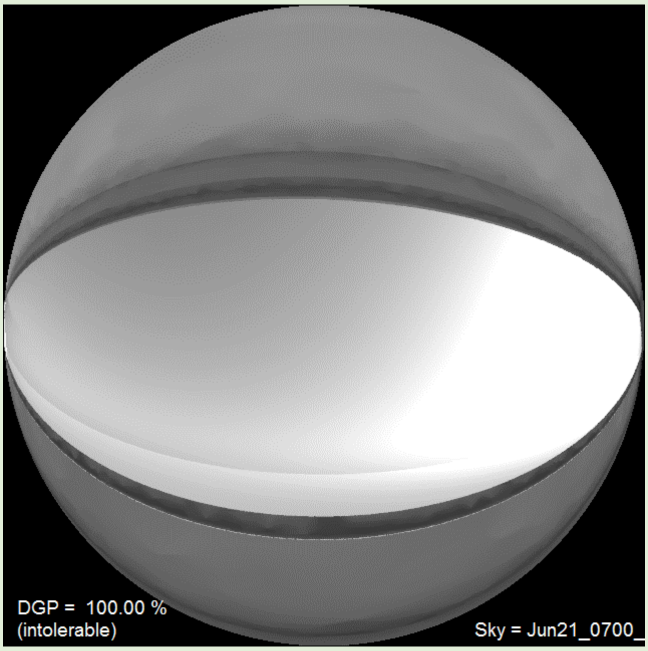

Glare indices summary
Glare Threshold = 1347.20 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 0.00 0.00 45.88 68.45 97.55 133.32 175.84 224.26 276.42 328.89 376.68 406.47 382.50
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1871
Sky file = Jun21_1500_ss.sky
Glare Threshold = 1347.20 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1347.20 cd/m²

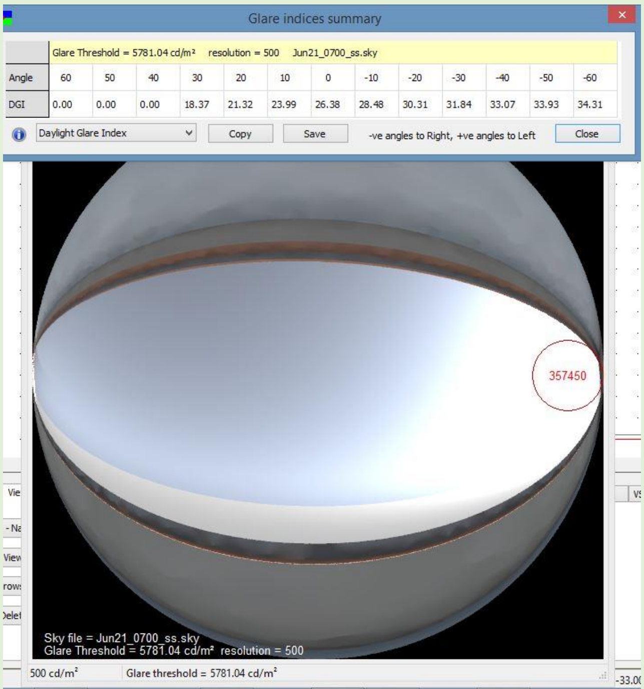
Table 196: Daylight and Glare Analysis for Jun 21, with sunny sky, (N), (P4/1.5),(T7).

Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P4/1.5m) (T7).

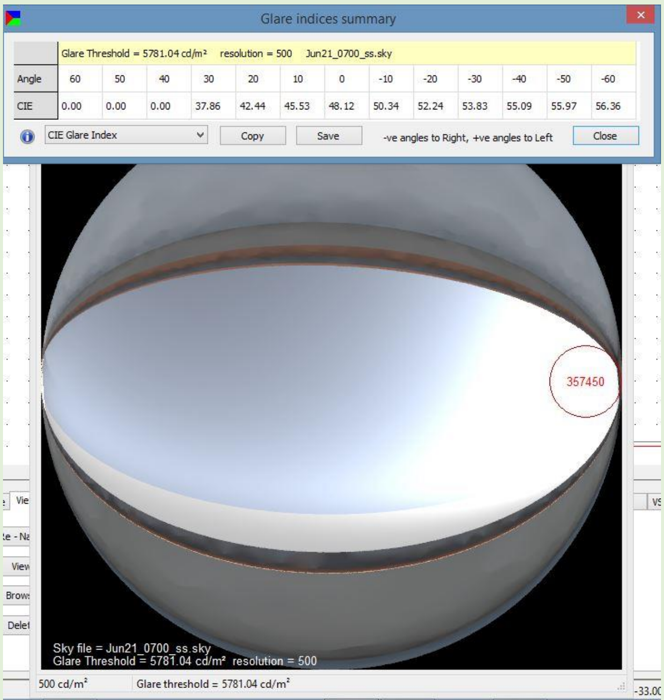
DGP



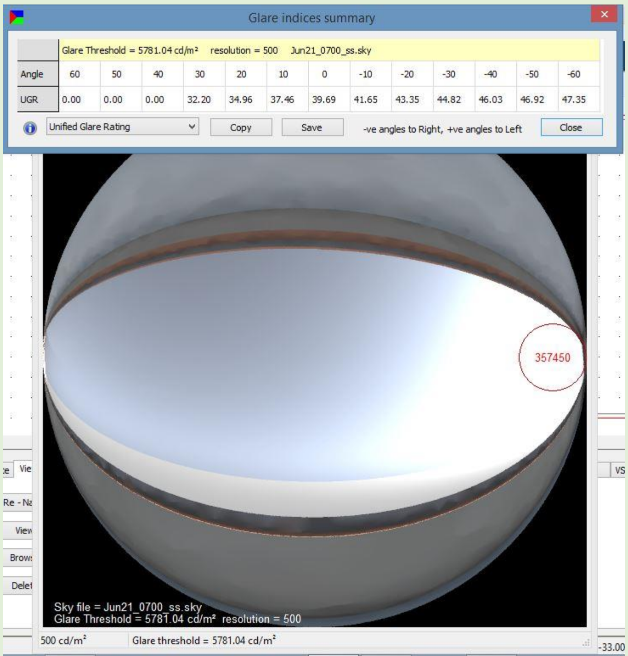
DGI



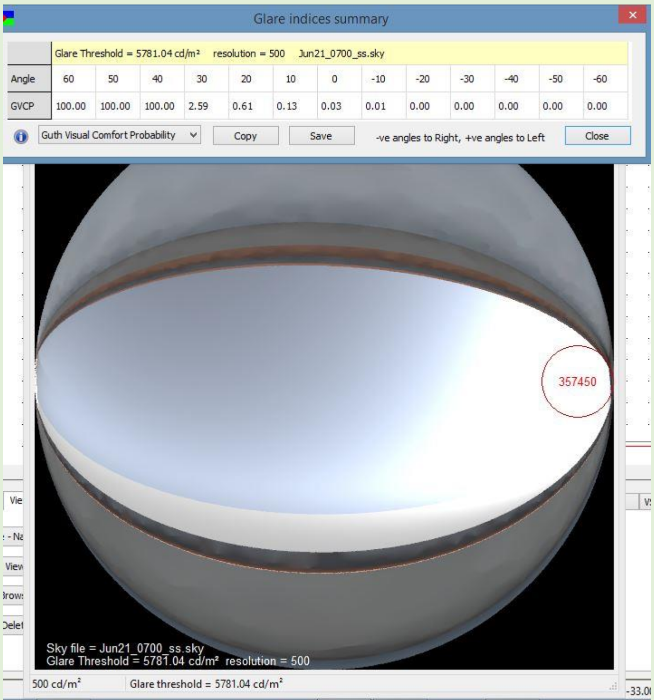
CGI



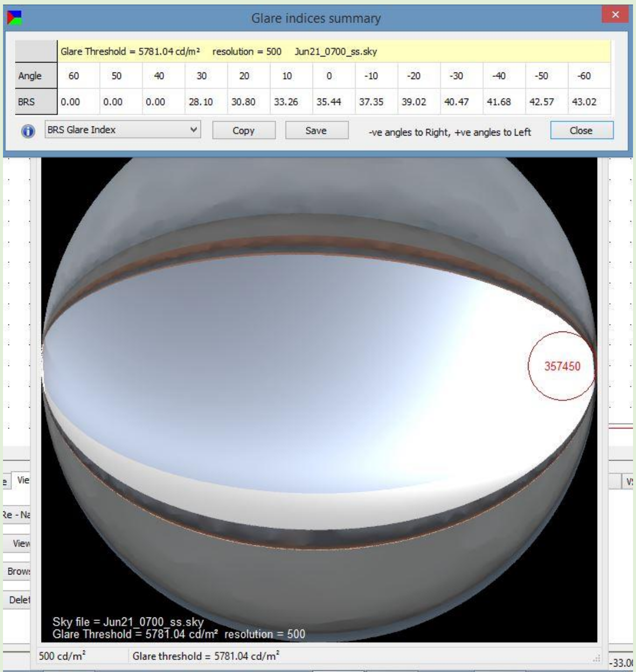
UGR



VCP


Glare indices summary
Glare Threshold = 5781.04 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 100.00 100.00 100.00 2.59 0.61 0.13 0.03 0.01 0.00 0.00 0.00 0.00 0.00
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
357450
Sky file = Jun21_0700_ss.sky
Glare Threshold = 5781.04 cd/m² resolution = 500
500 cd/m²
Glare threshold = 5781.04 cd/m²

BRS


Glare indices summary
Glare Threshold = 5781.04 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 0.00 0.00 0.00 28.10 30.80 33.26 35.44 37.35 39.02 40.47 41.68 42.57 43.02
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
357450
Sky file = Jun21_0700_ss.sky
Glare Threshold = 5781.04 cd/m² resolution = 500
500 cd/m²
Glare threshold = 5781.04 cd/m²

GDGR

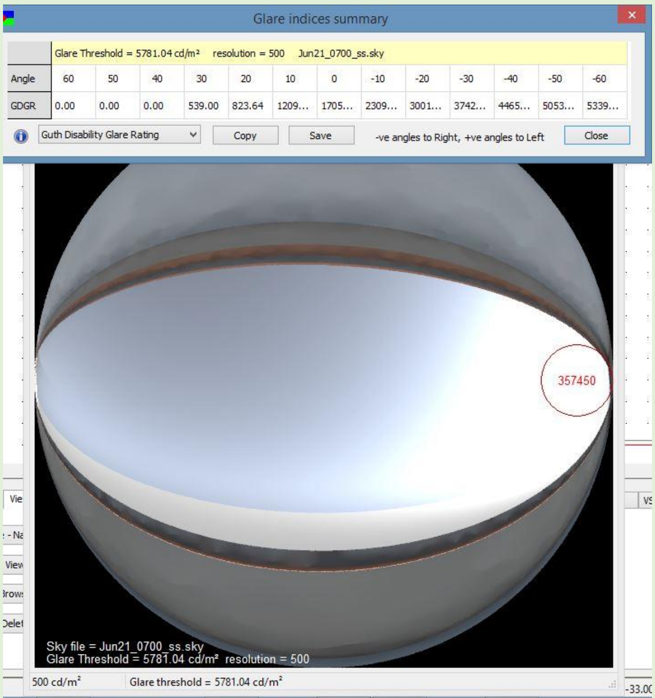

Glare indices summary
Glare Threshold = 5781.04 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 0.00 0.00 0.00 539.00 823.64 1209... 1705... 2309... 3001... 3742... 4465... 5053... 5339...
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
357450
Sky file = Jun21_0700_ss.sky
Glare Threshold = 5781.04 cd/m² resolution = 500
500 cd/m²
Glare threshold = 5781.04 cd/m²

Table 197: Daylight and Glare Analysis for Jun 21, with sunny sky, (N), (P4/1.5),(T9).

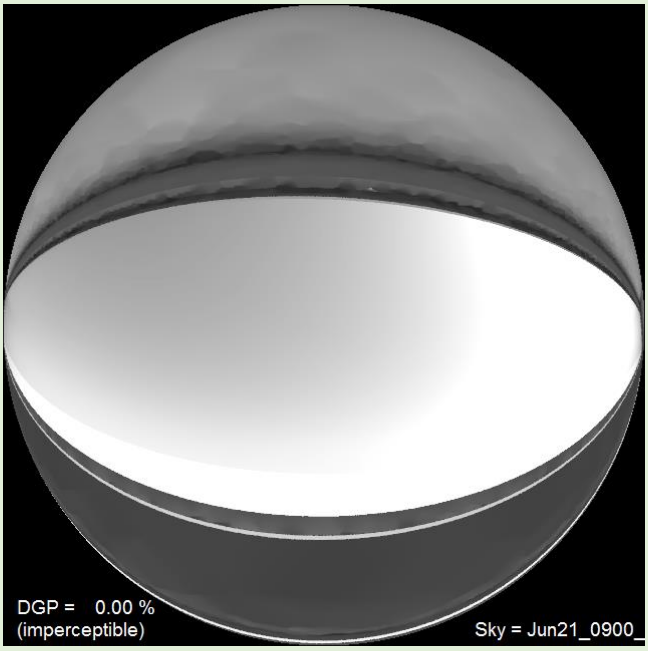
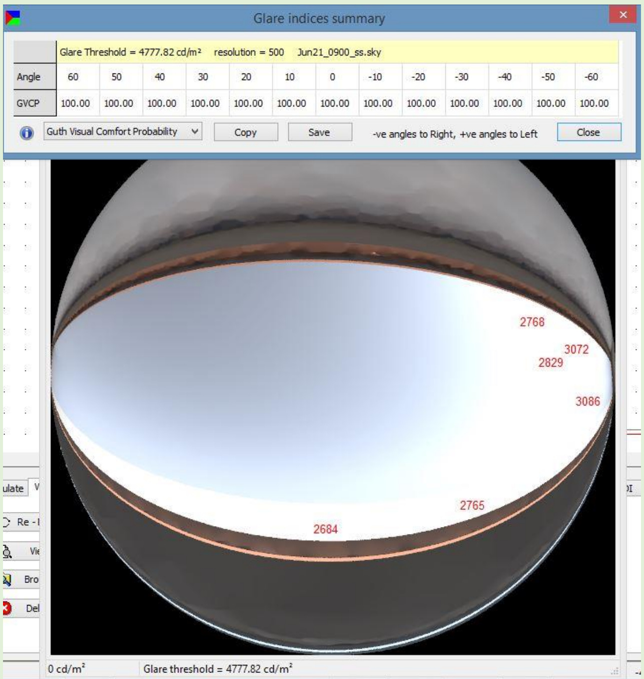
Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P4/1.5m) (T9).	
DGP	**VCP**
	

Table 198: Daylight and Glare Analysis for Jun 21, with sunny sky, (N), (P4/1.5),(T12).

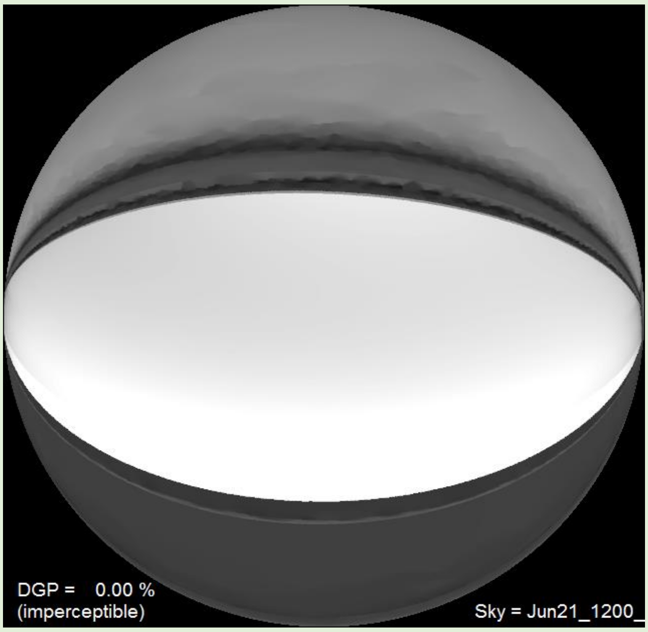
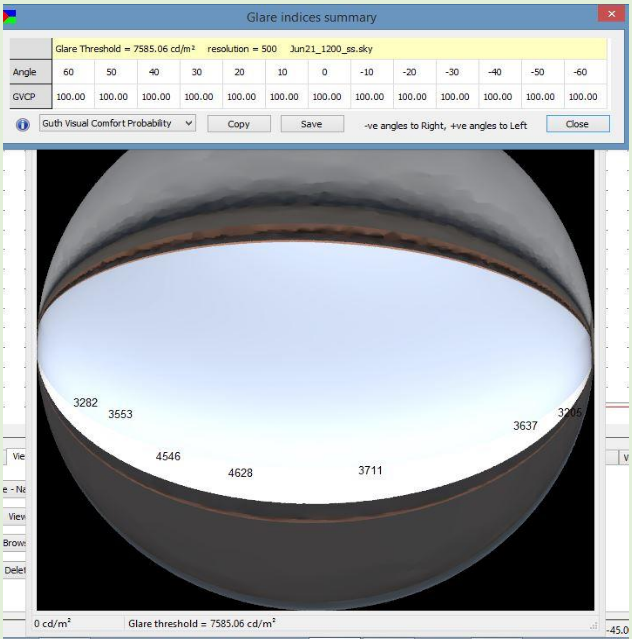
Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P4/1.5m) (T12).	
DGP	**VCP**
	

Table 199: Daylight and Glare Analysis for Jun 21, with sunny sky, (N), (P4/1.5),(T15).

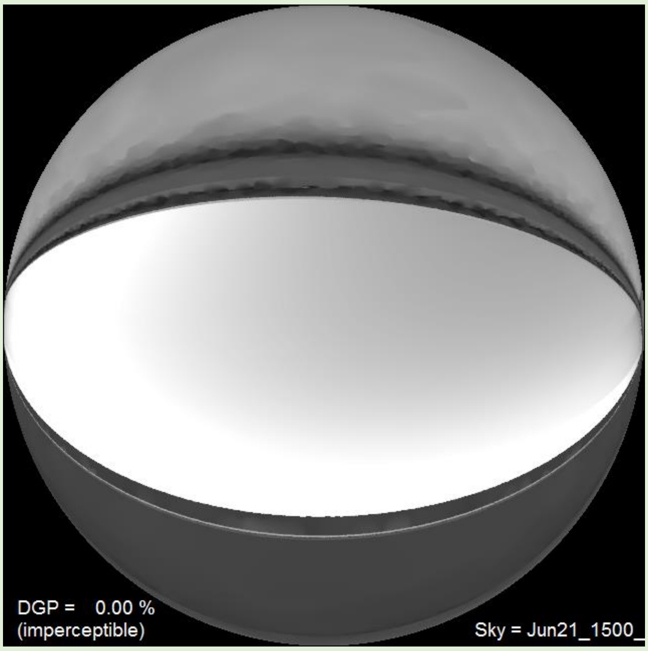
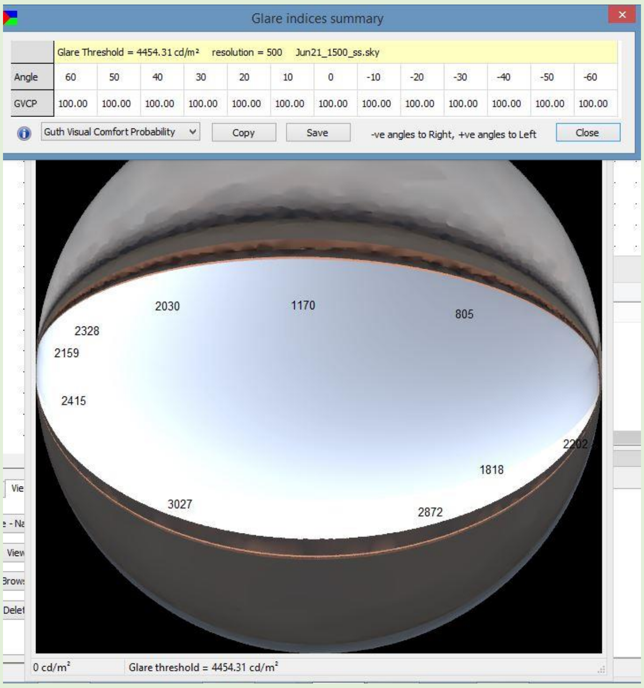
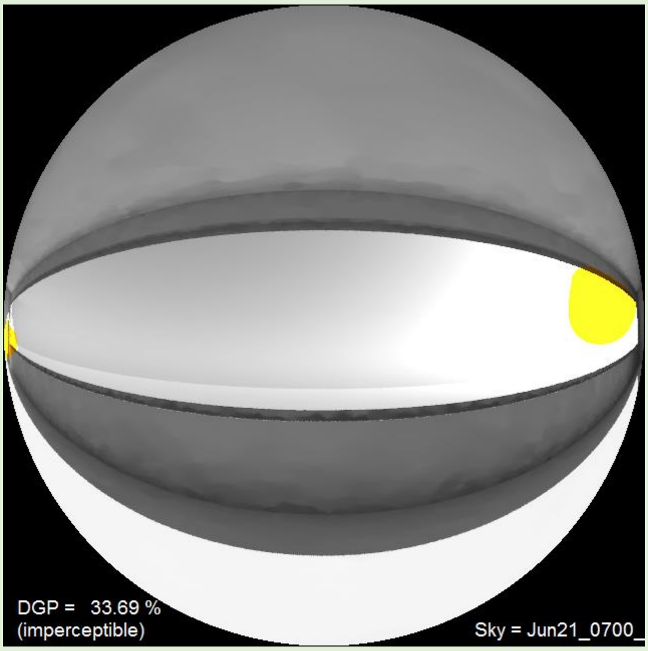
<table>
<tr><th colspan="2">Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P4/1.5m) (T15).</th></tr>
<tr><th>DGP</th><th>VCP</th></tr>
<tr><td>
</td><td>
</td></tr>
</table>

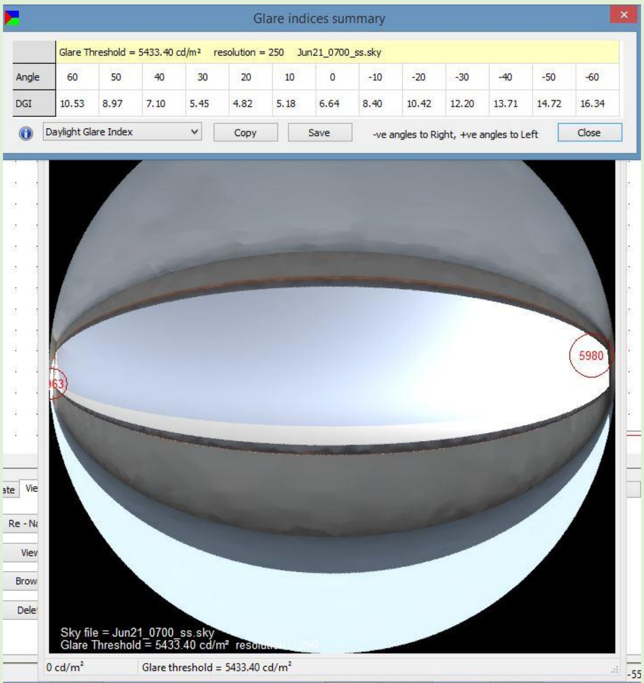
Table 200: Daylight and Glare Analysis for Jun 21, with sunny sky, (N), (P4/3m),(T7).

Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P4/3m) (T7).

DGP

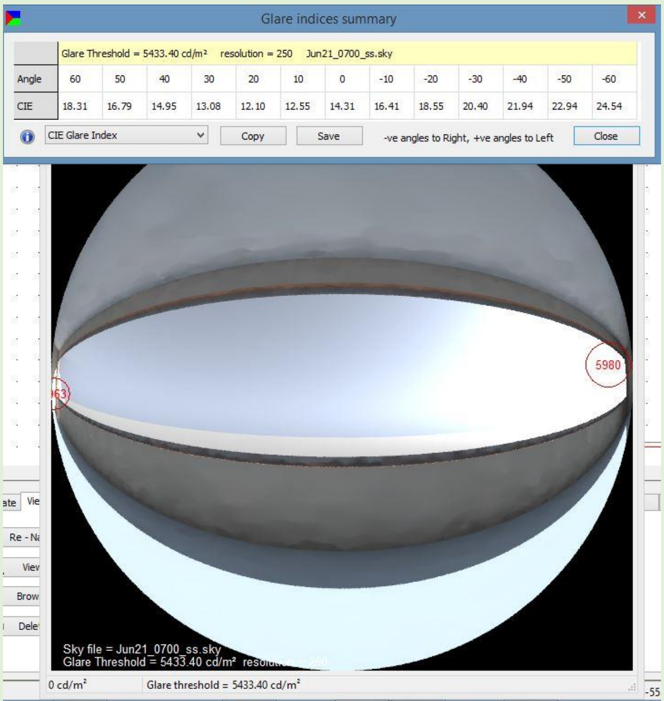


DGI



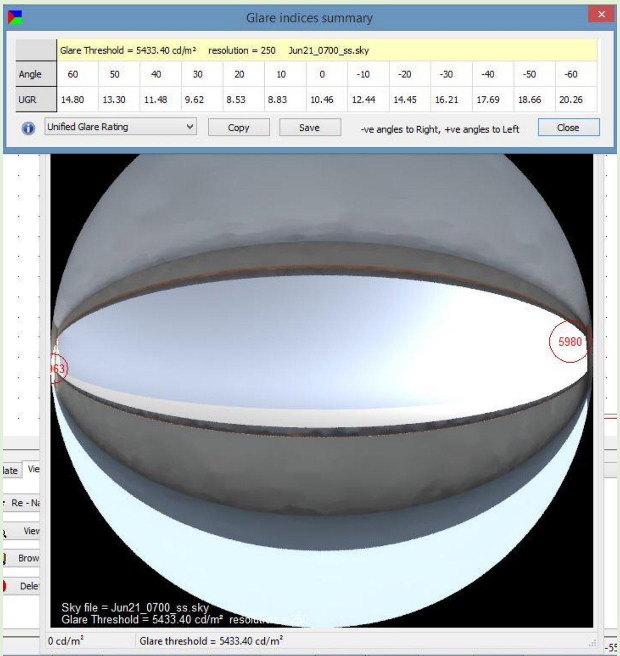
Angle	60	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
DGI	10.53	8.97	7.10	5.45	4.82	5.18	6.64	8.40	10.42	12.20	13.71	14.72	16.34

CGI



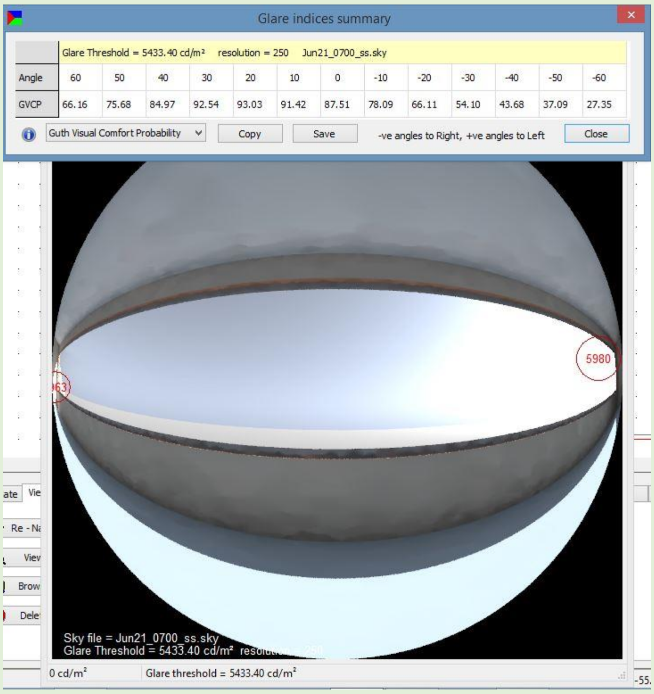
Angle	60	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
CIE	18.31	16.79	14.95	13.08	12.10	12.55	14.31	16.41	18.55	20.40	21.94	22.94	24.54

UGR

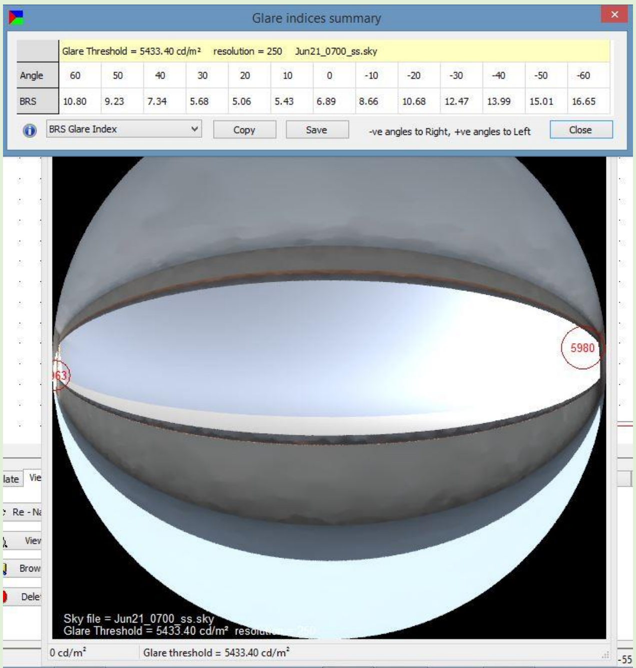


Angle	60	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
UGR	14.80	13.30	11.48	9.62	8.53	8.83	10.46	12.44	14.45	16.21	17.69	18.66	20.26

VCP


Glare indices summary
Glare Threshold = 5433.40 cd/m² resolution = 250 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 66.16 75.68 84.97 92.54 93.03 91.42 87.51 78.09 66.11 54.10 43.68 37.09 27.35
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
5980
Sky file = Jun21_0700_ss.sky
0 cd/m²
Glare threshold = 5433.40 cd/m²

BRS


Glare indices summary
Glare Threshold = 5433.40 cd/m² resolution = 250 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 10.80 9.23 7.34 5.68 5.06 5.43 6.89 8.66 10.68 12.47 13.99 15.01 16.65
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
5980
Sky file = Jun21_0700_ss.sky
0 cd/m²
Glare threshold = 5433.40 cd/m²

GDGR

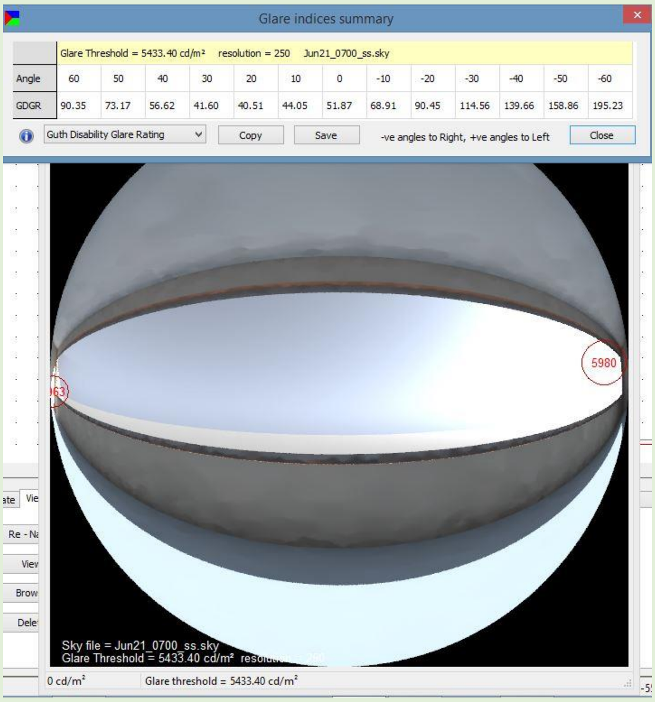
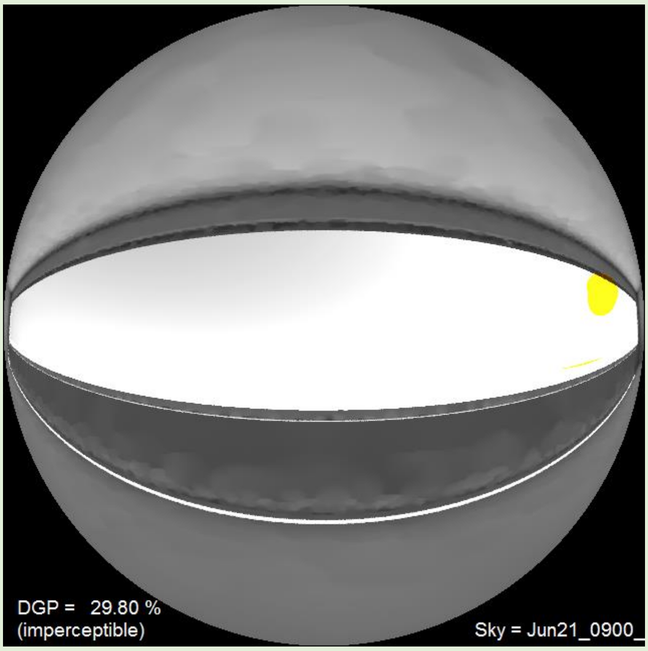

Glare indices summary
Glare Threshold = 5433.40 cd/m² resolution = 250 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 90.35 73.17 56.62 41.60 40.51 44.05 51.87 68.91 90.45 114.56 139.66 158.86 195.23
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
5980
Sky file = Jun21_0700_ss.sky
0 cd/m²
Glare threshold = 5433.40 cd/m²

Table 201: Daylight and Glare Analysis for Jun 21, with sunny sky, (N), (P4/3m),(T9).

Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P4/3m) (T9).

DGP



VCP

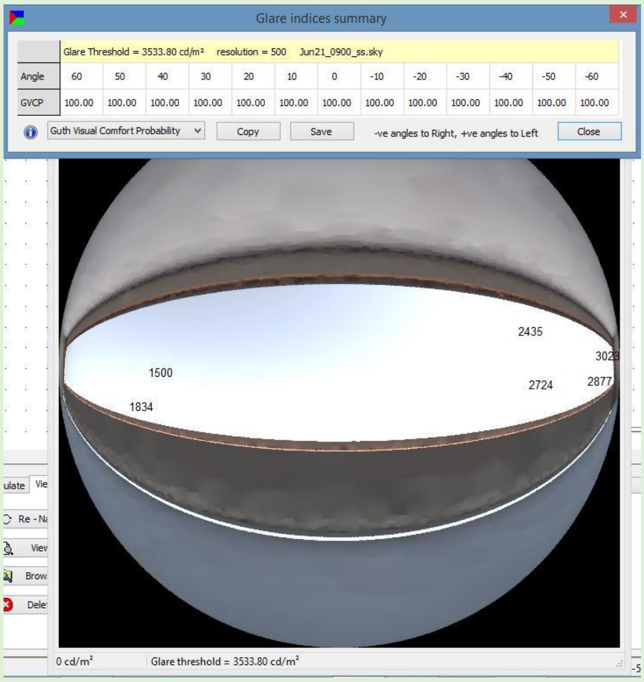
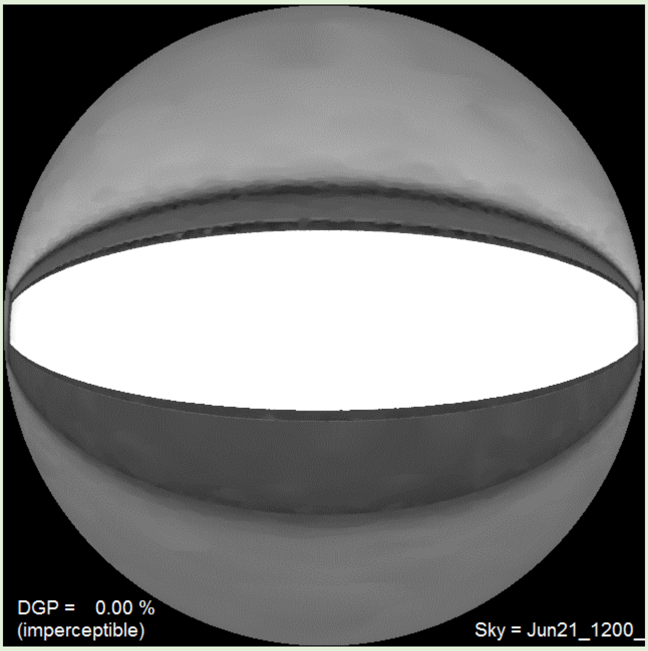


Table 202: Daylight and Glare Analysis for Jun 21, with sunny sky, (N), (P4/3m),(T12).

Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P4/3m) (T12).

DGP



VCP

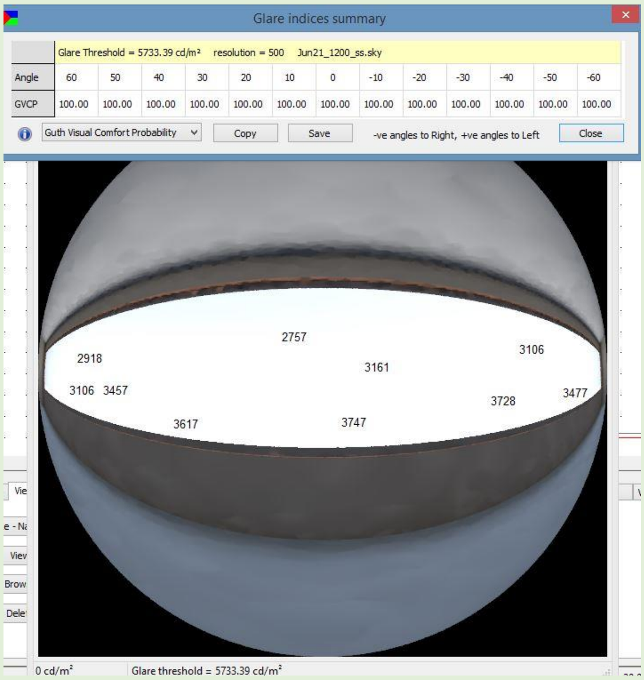


Table 203: Daylight and Glare Analysis for Jun 21, with sunny sky, (N), (P4/3m),(T15).

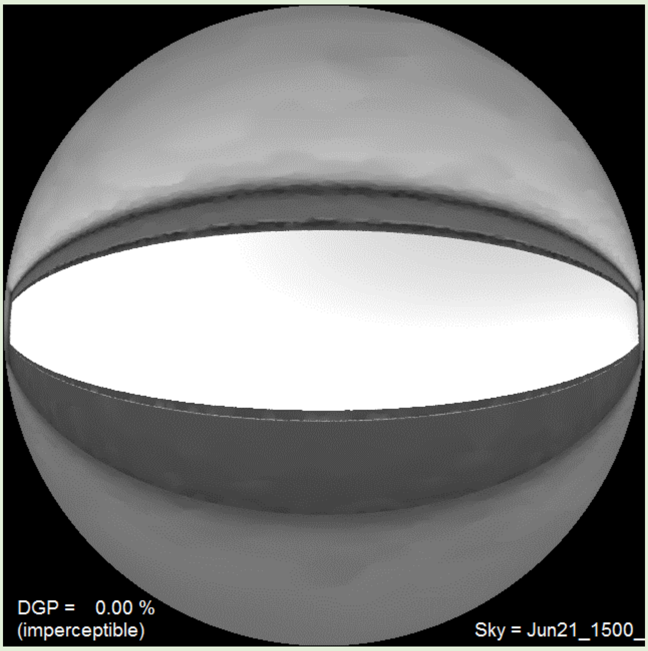
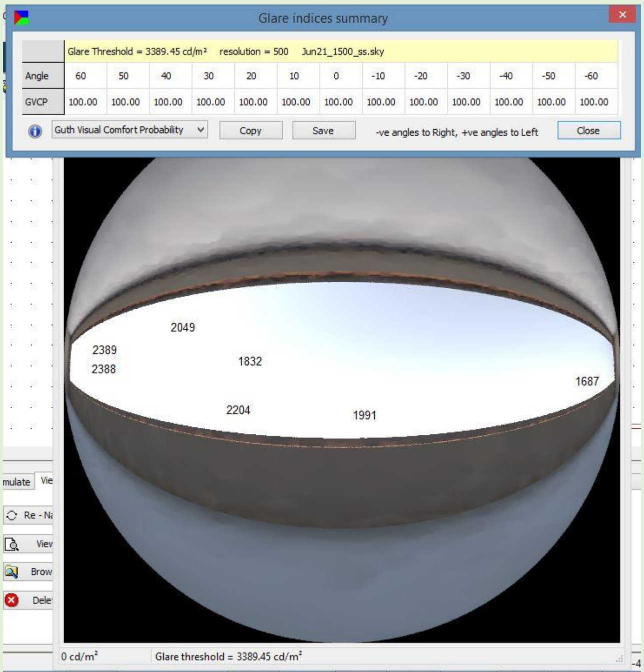
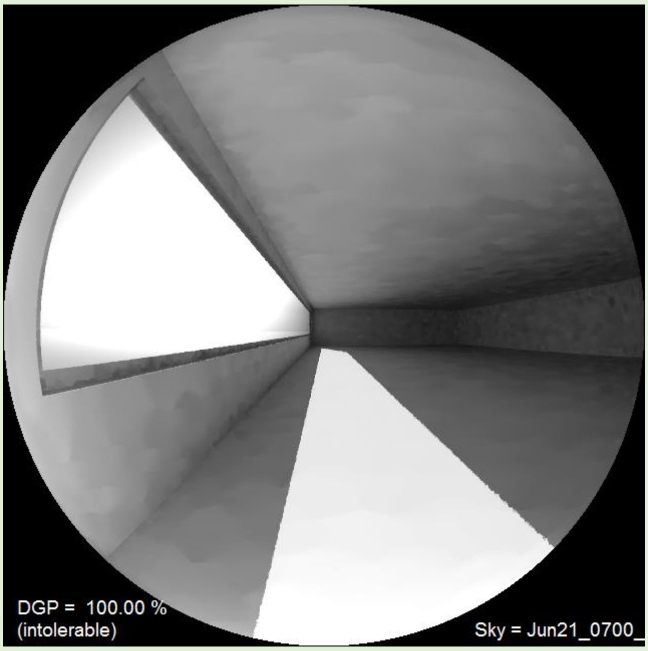
Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P4/3m) (T15).	
DGP	**VCP**
	

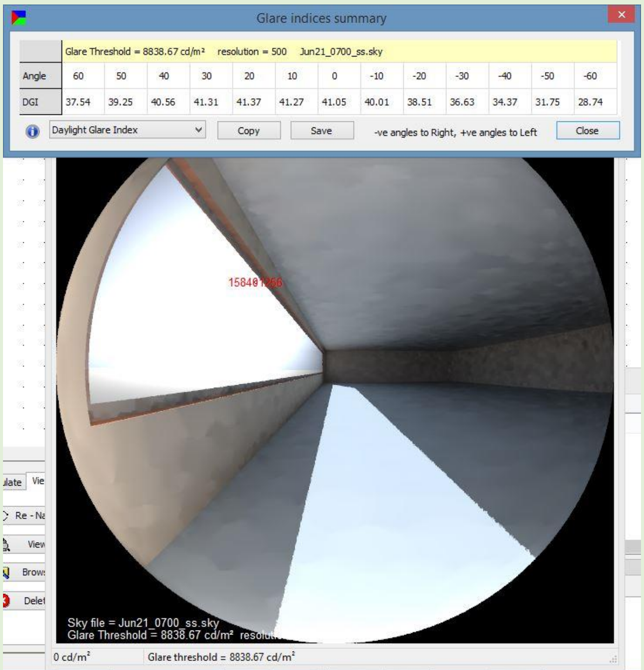
Table 204: Daylight and Glare Analysis for Jun 21, with sunny sky, (N), (P5/1.5m),(T7).

Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P5/1.5m) (T7).

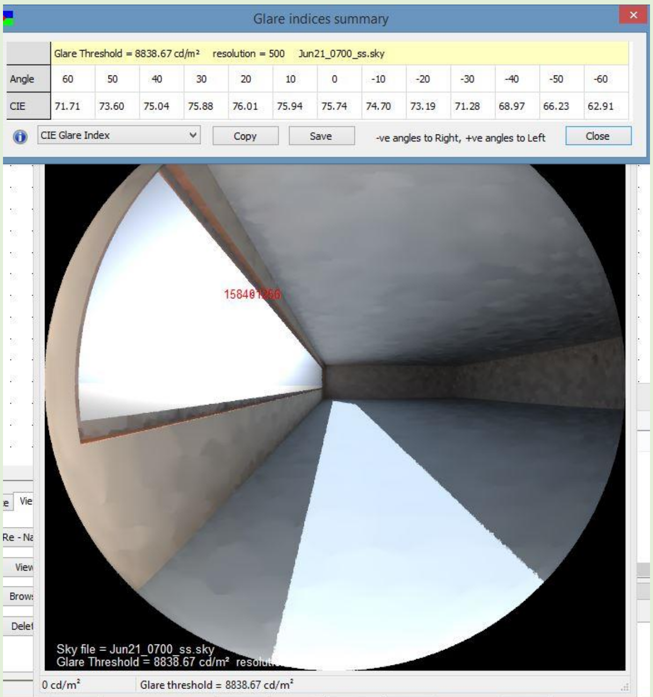
DGP



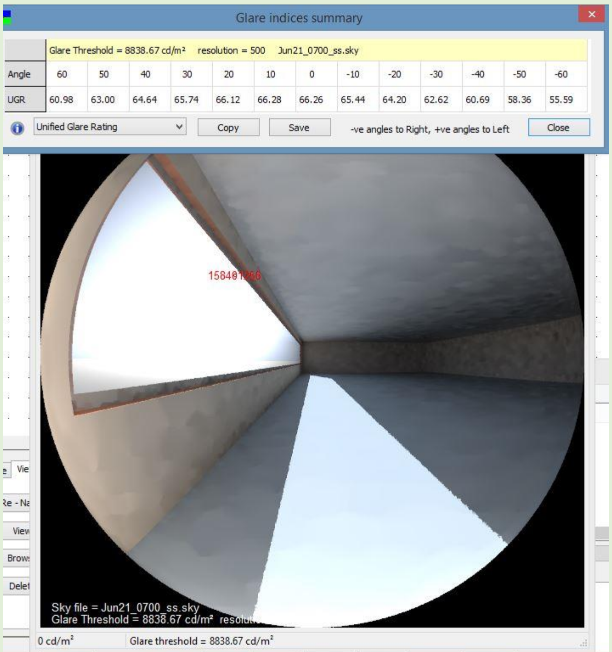
DGI

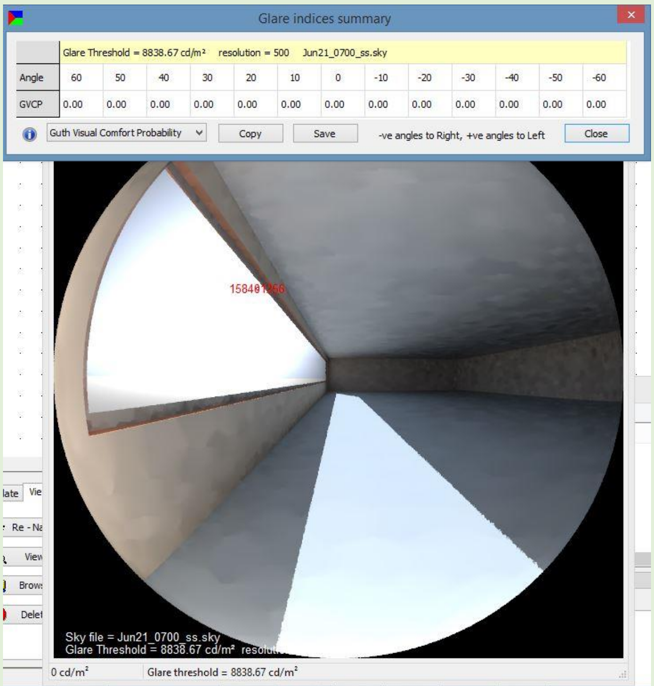
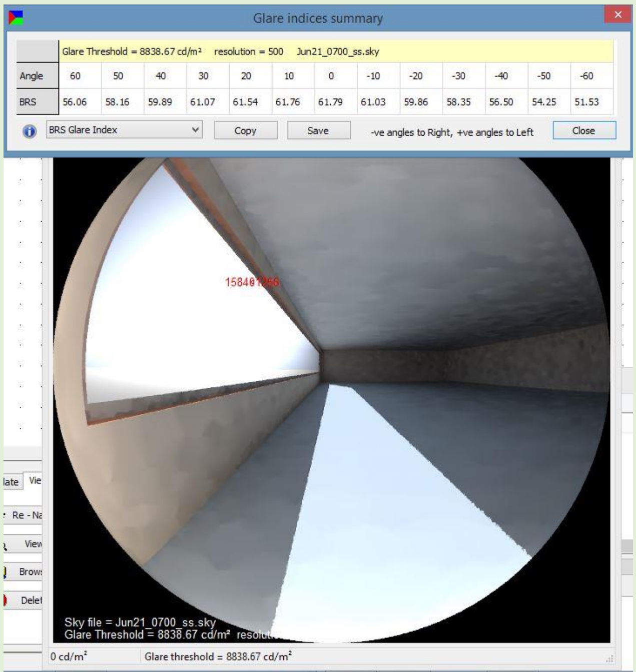


CGI



UGR

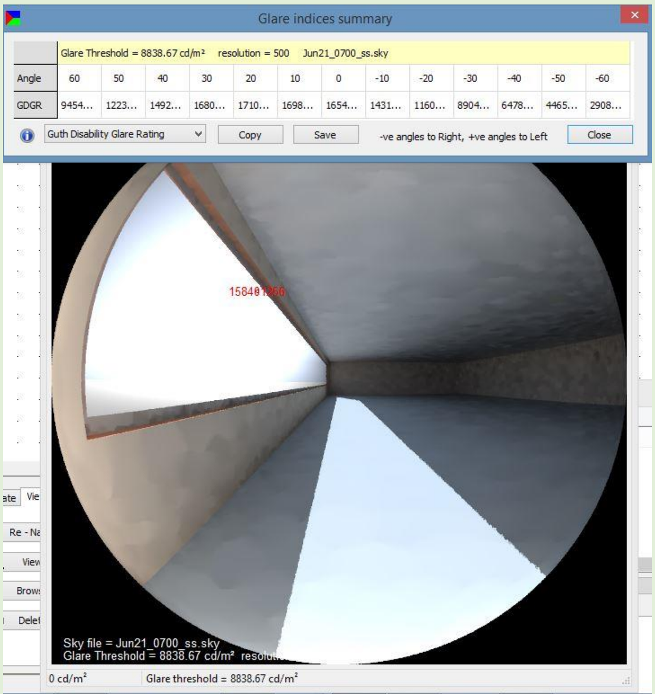


VCP	BRS
	

Glare indices summary
Glare Threshold = 8838.67 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_0700_ss.sky
0 cd/m²
Glare threshold = 8838.67 cd/m²

Glare indices summary
Glare Threshold = 8838.67 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 56.06 58.16 59.89 61.07 61.54 61.76 61.79 61.03 59.86 58.35 56.50 54.25 51.53
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_0700_ss.sky
0 cd/m²
Glare threshold = 8838.67 cd/m²

GDGR

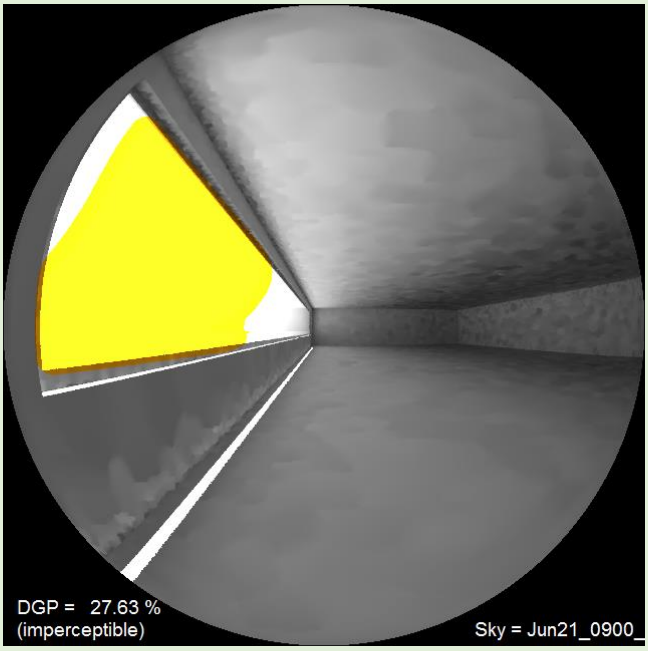


Glare indices summary
Glare Threshold = 8838.67 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 9454... 1223... 1492... 1680... 1710... 1698... 1654... 1431... 1160... 8904... 6478... 4465... 2908...
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_0700_ss.sky
0 cd/m²
Glare threshold = 8838.67 cd/m²

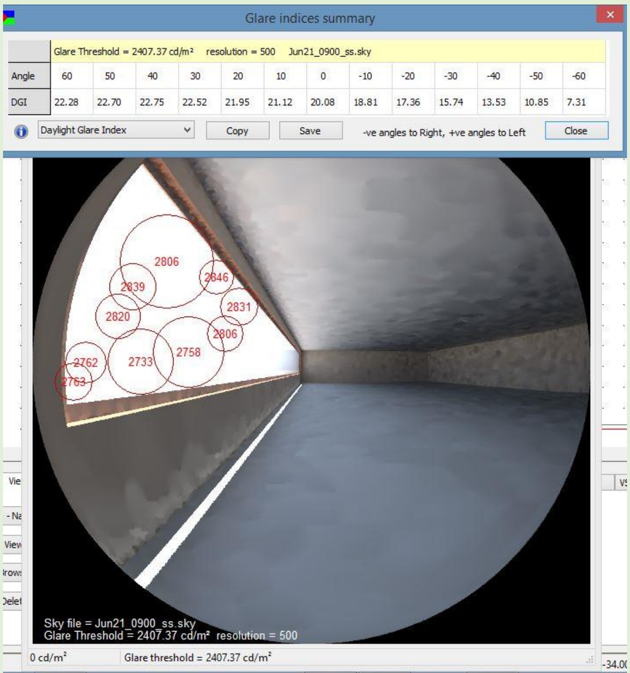
Table 205: Daylight and Glare Analysis for Jun 21, with sunny sky, (N), (P5/1.5m),(T9).

Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P5/1.5m) (T9).

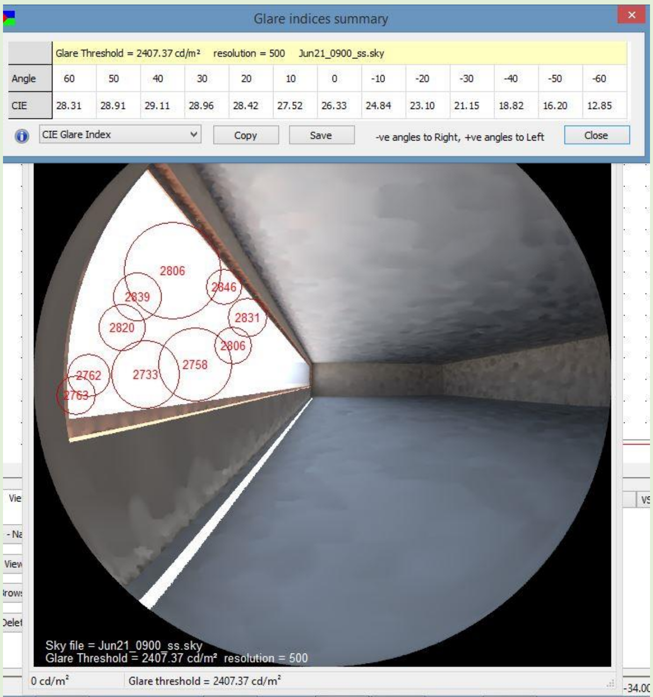
DGP



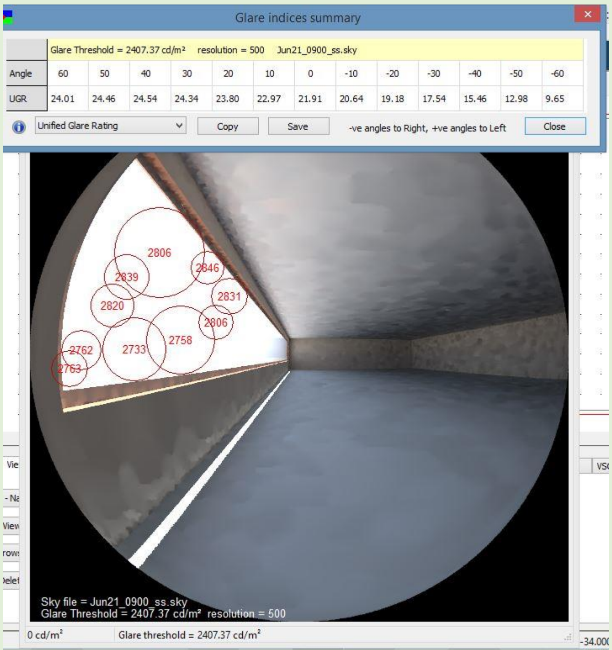
DGI

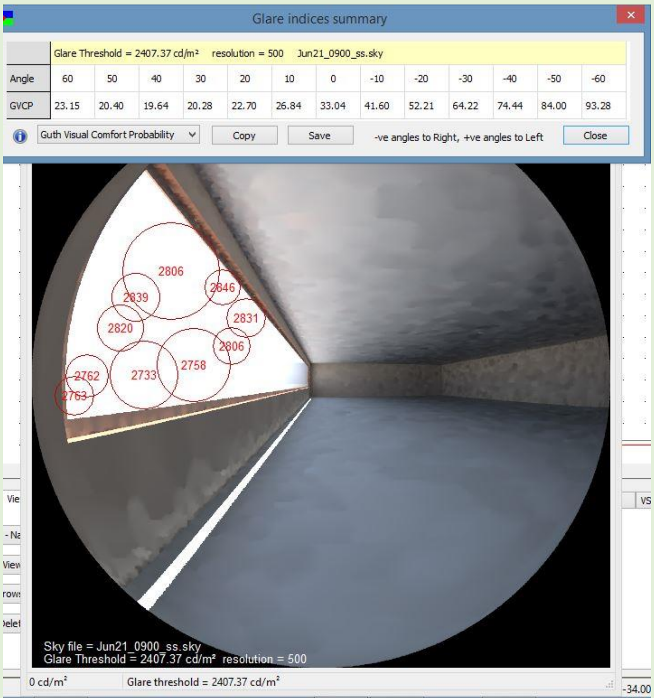
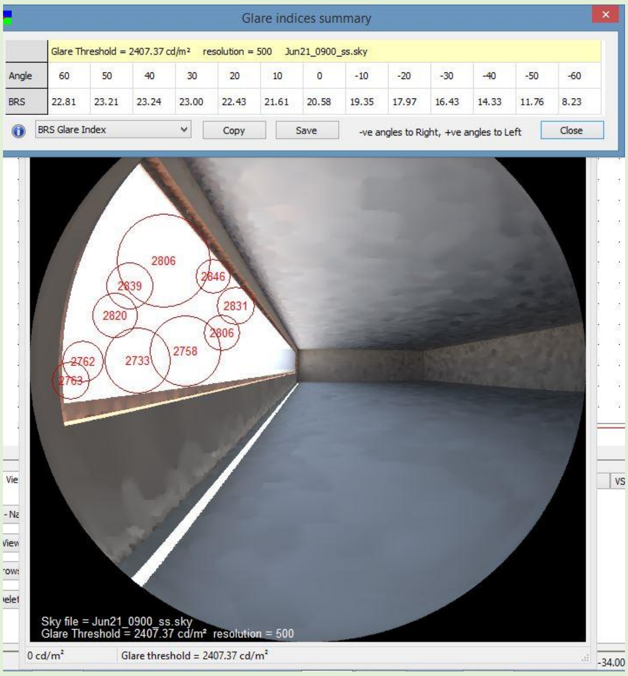


CGI



UGR

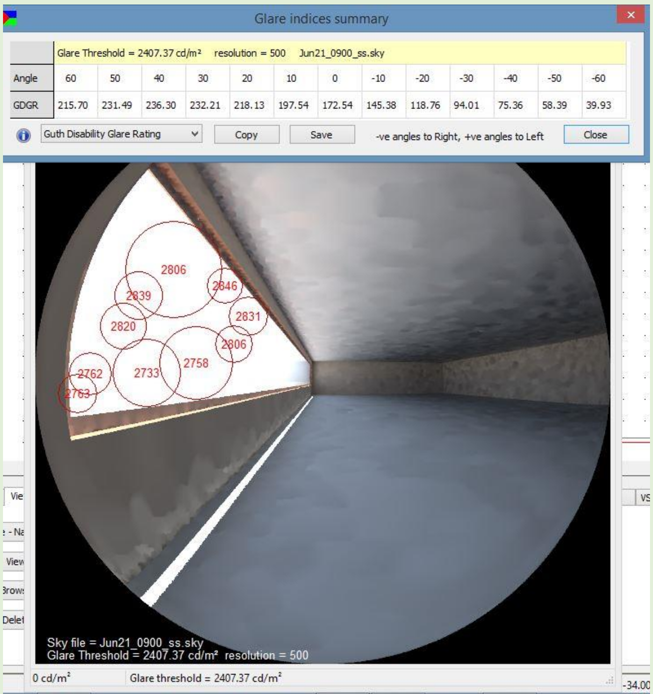


VCP	BRS
	

Glare indices summary
Glare Threshold = 2407.37 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 23.15 20.40 19.64 20.28 22.70 26.84 33.04 41.60 52.21 64.22 74.44 84.00 93.28
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_0900_ss.sky
Glare Threshold = 2407.37 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2407.37 cd/m²

Glare indices summary
Glare Threshold = 2407.37 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 22.81 23.21 23.24 23.00 22.43 21.61 20.58 19.35 17.97 16.43 14.33 11.76 8.23
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_0900_ss.sky
Glare Threshold = 2407.37 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2407.37 cd/m²

GDGR

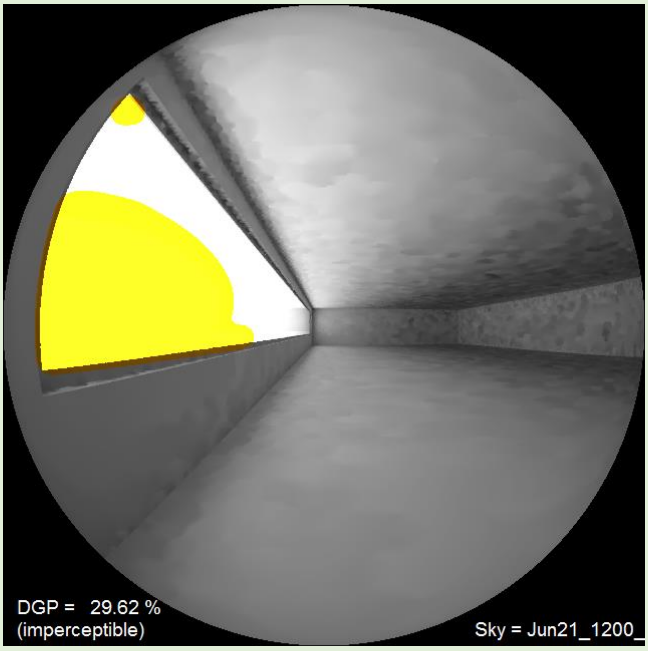


Glare indices summary
Glare Threshold = 2407.37 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 215.70 231.49 236.30 232.21 218.13 197.54 172.54 145.38 118.76 94.01 75.36 58.39 39.93
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_0900_ss.sky
Glare Threshold = 2407.37 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2407.37 cd/m²

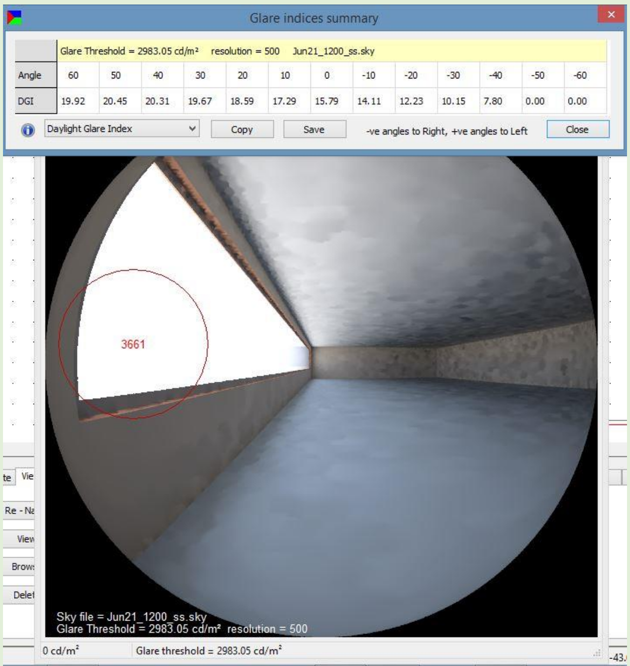
Table 206: Daylight and Glare Analysis for Jun 21, with sunny sky, (N), (P5/1.5m),(T12).

Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P5/1.5m) (T12).

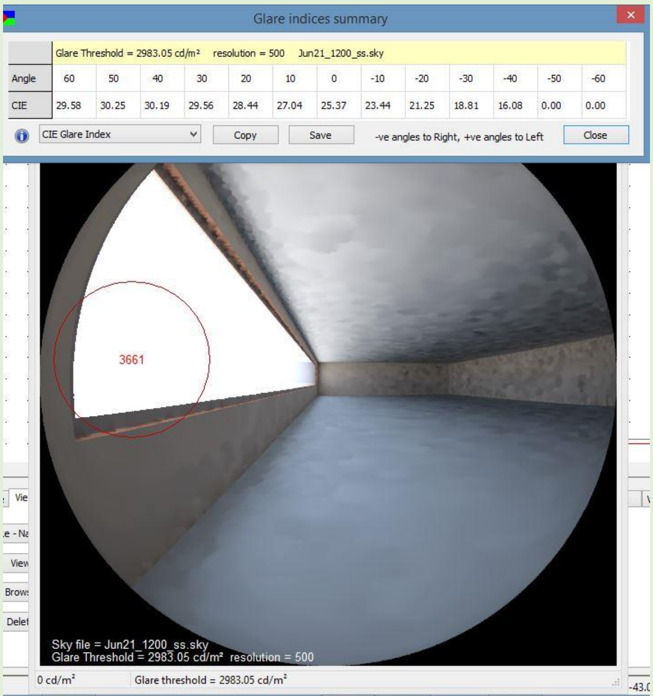
DGP



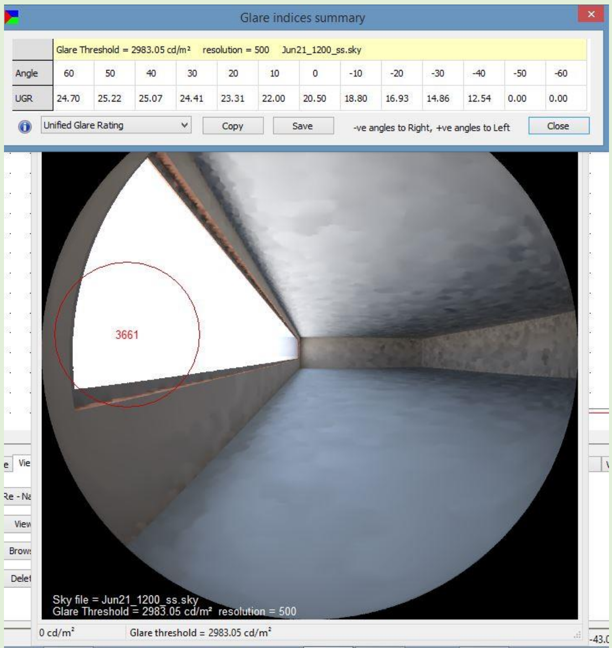
DGI

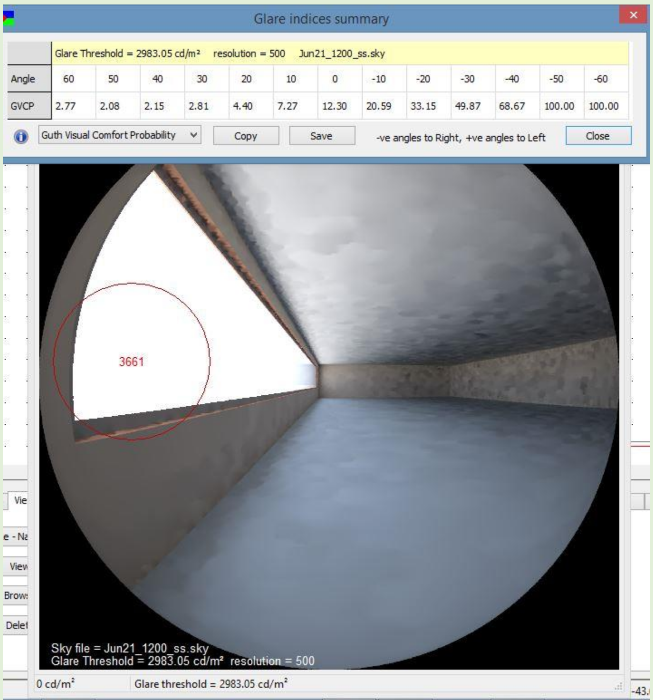
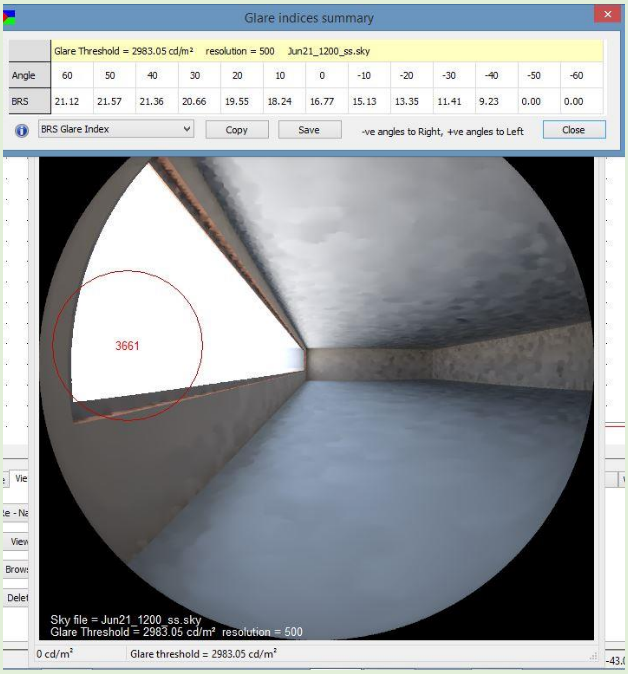


CGI



UGR

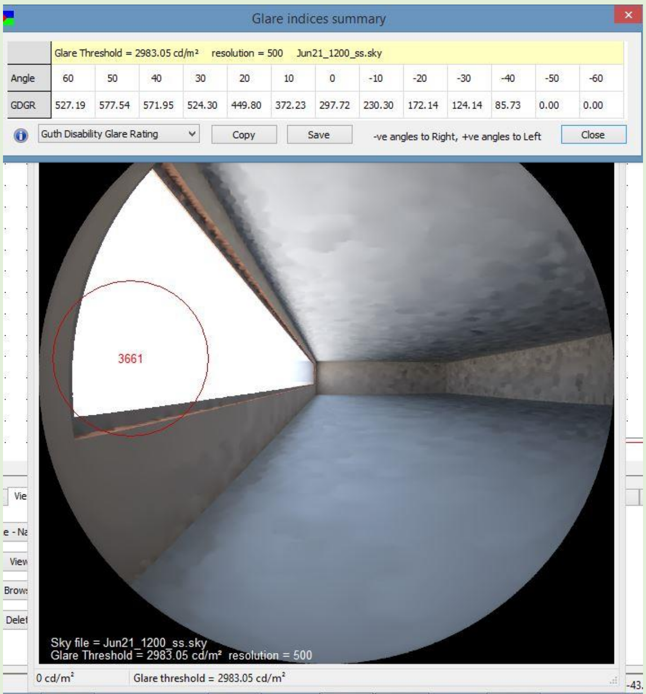


VCP	BRS
	

Glare indices summary
Glare Threshold = 2983.05 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 2.77 2.08 2.15 2.81 4.40 7.27 12.30 20.59 33.15 49.87 68.67 100.00 100.00
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3661
Sky file = Jun21_1200_ss.sky
Glare Threshold = 2983.05 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2983.05 cd/m²

Glare indices summary
Glare Threshold = 2983.05 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 21.12 21.57 21.36 20.66 19.55 18.24 16.77 15.13 13.35 11.41 9.23 0.00 0.00
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3661
Sky file = Jun21_1200_ss.sky
Glare Threshold = 2983.05 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2983.05 cd/m²

GDGR

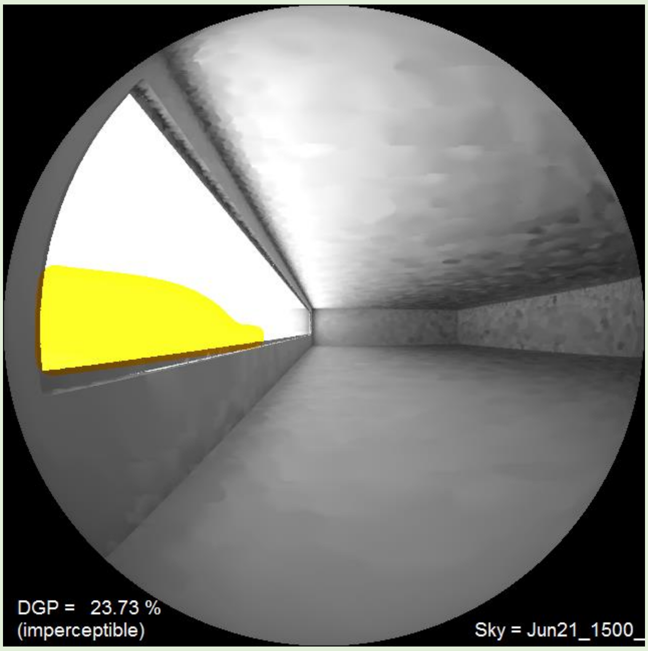


Glare indices summary
Glare Threshold = 2983.05 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 527.19 577.54 571.95 524.30 449.80 372.23 297.72 230.30 172.14 124.14 85.73 0.00 0.00
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3661
Sky file = Jun21_1200_ss.sky
Glare Threshold = 2983.05 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2983.05 cd/m²

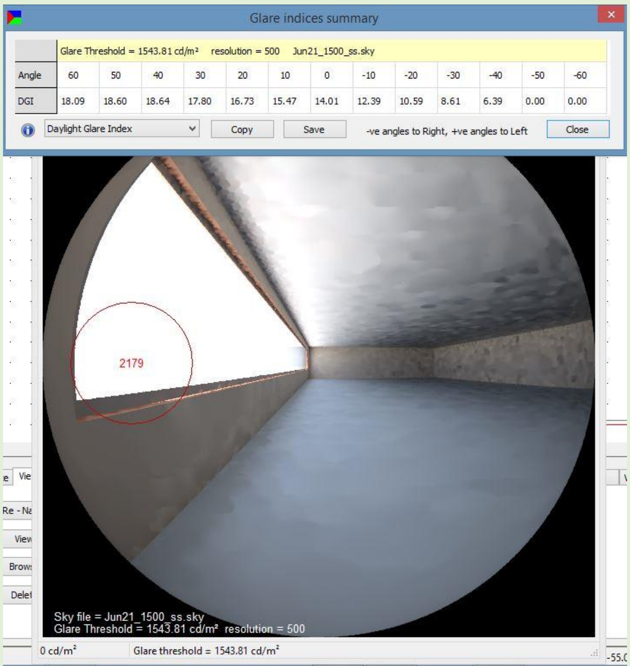
Table 207: Daylight and Glare Analysis for Jun 21, with sunny sky, (N), (P5/1.5m),(T15).

Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P5/1.5m) (T15).

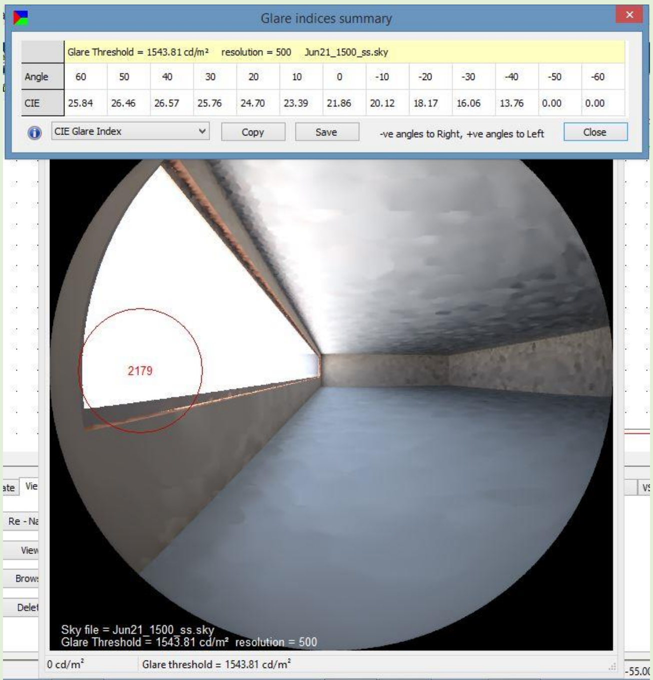
DGP



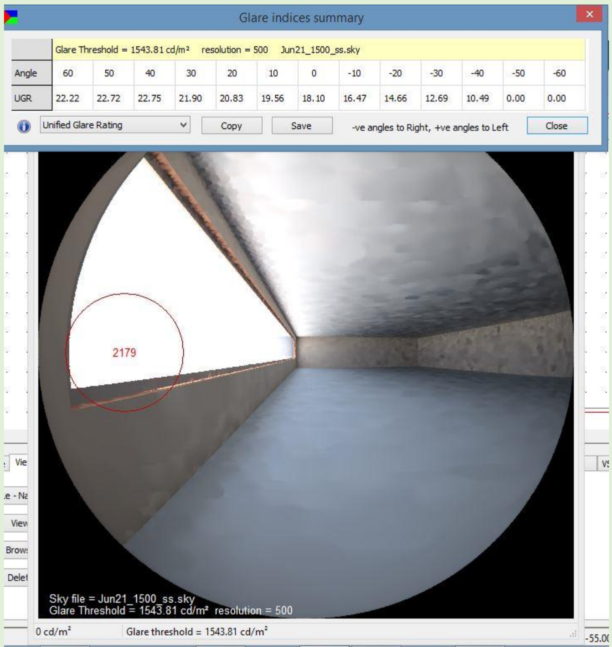
DGI

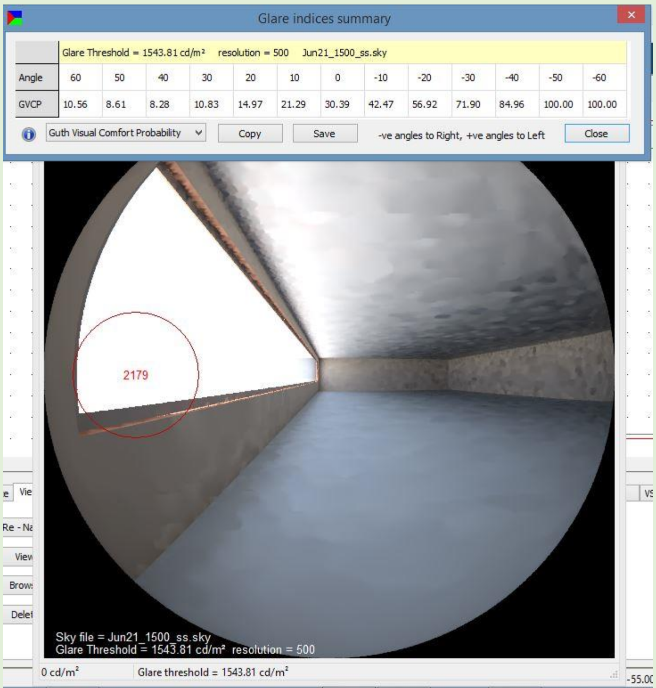
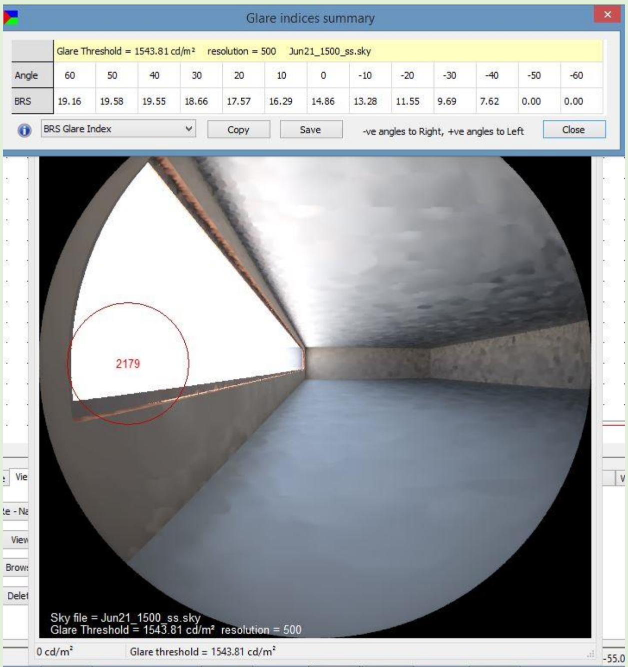


CGI



UGR

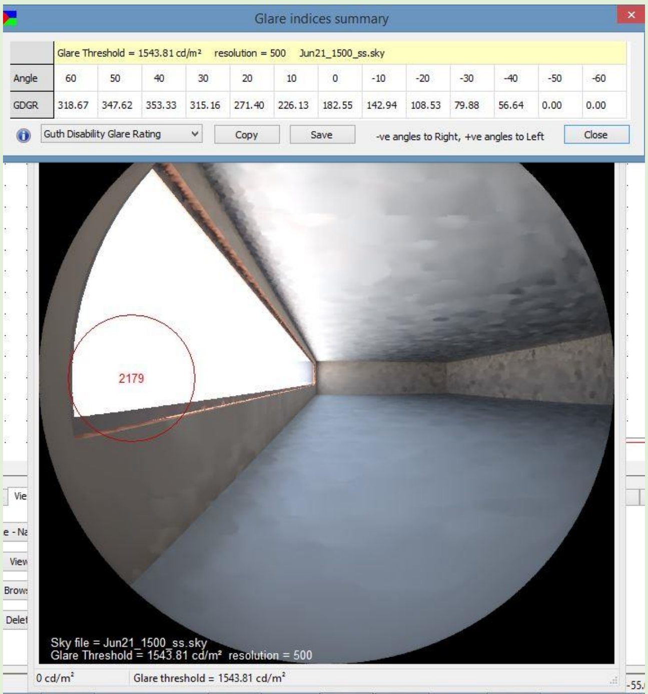


VCP	**BRS**
	

Glare indices summary
Glare Threshold = 1543.81 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 10.56 8.61 8.28 10.83 14.97 21.29 30.39 42.47 56.92 71.90 84.96 100.00 100.00
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2179
Sky file = Jun21_1500_ss.sky
Glare Threshold = 1543.81 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1543.81 cd/m²

Glare indices summary
Glare Threshold = 1543.81 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 19.16 19.58 19.55 18.66 17.57 16.29 14.86 13.28 11.55 9.69 7.62 0.00 0.00
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2179
Sky file = Jun21_1500_ss.sky
Glare Threshold = 1543.81 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1543.81 cd/m²

GDGR

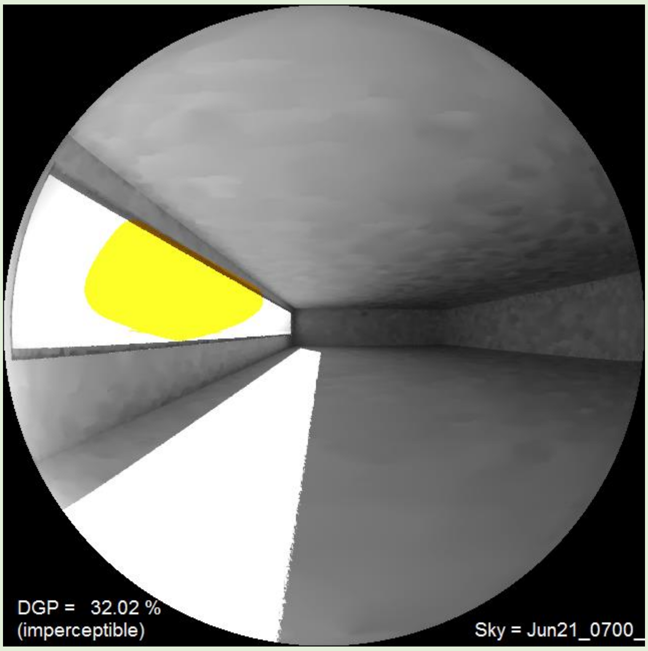


Glare indices summary
Glare Threshold = 1543.81 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 318.67 347.62 353.33 315.16 271.40 226.13 182.55 142.94 108.53 79.88 56.64 0.00 0.00
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2179
Sky file = Jun21_1500_ss.sky
Glare Threshold = 1543.81 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1543.81 cd/m²

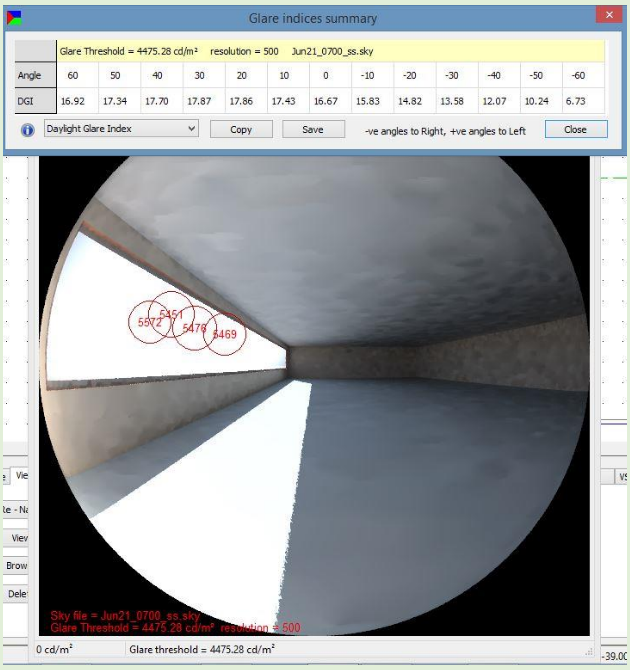
Table 208: Daylight and Glare Analysis for Jun 21, with sunny sky, (N), (P5/3m),(T7).

Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P5/3m) (T7).

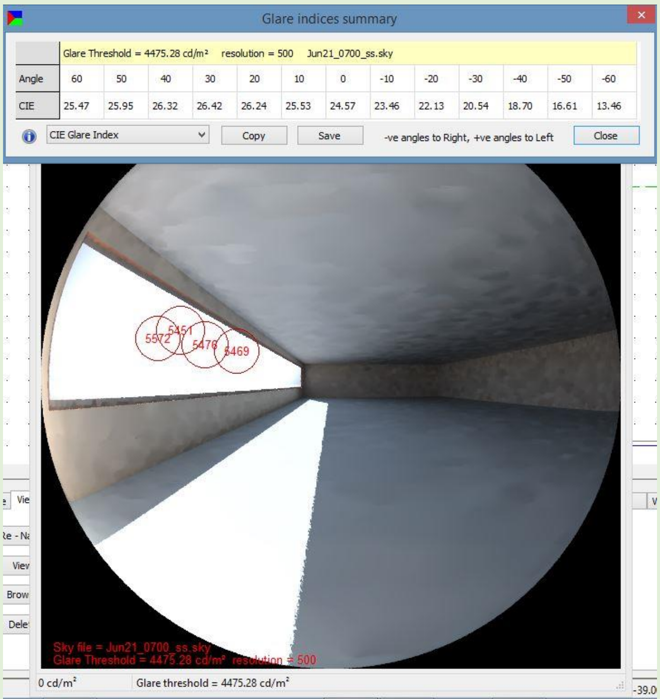
DGP



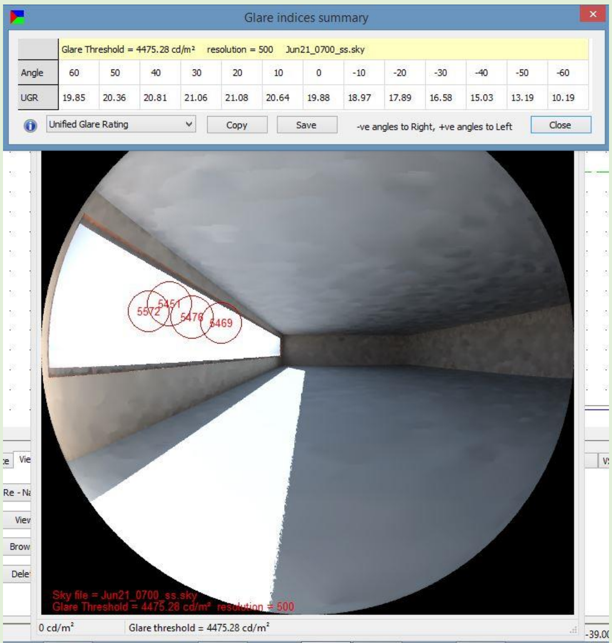
DGI

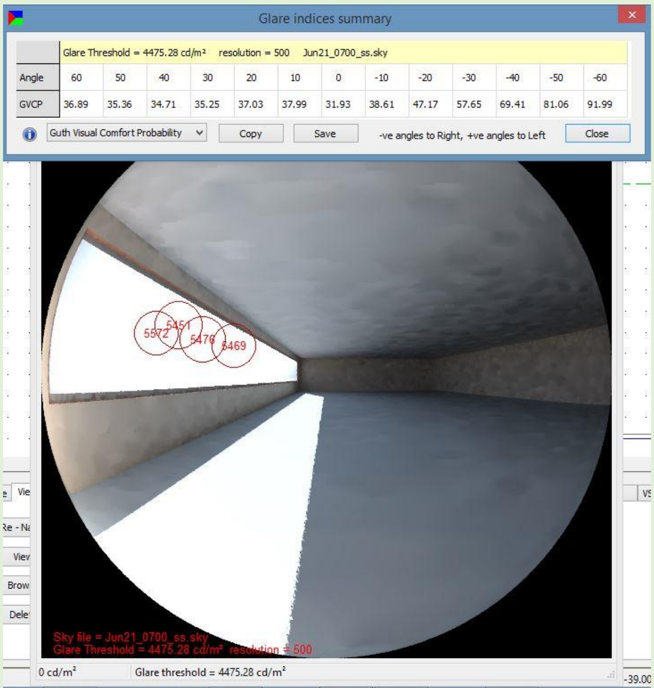
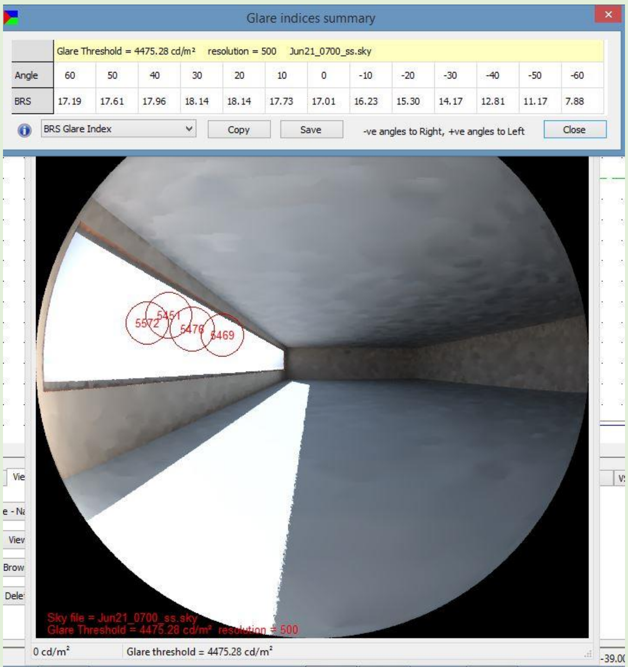


CGI



UGR

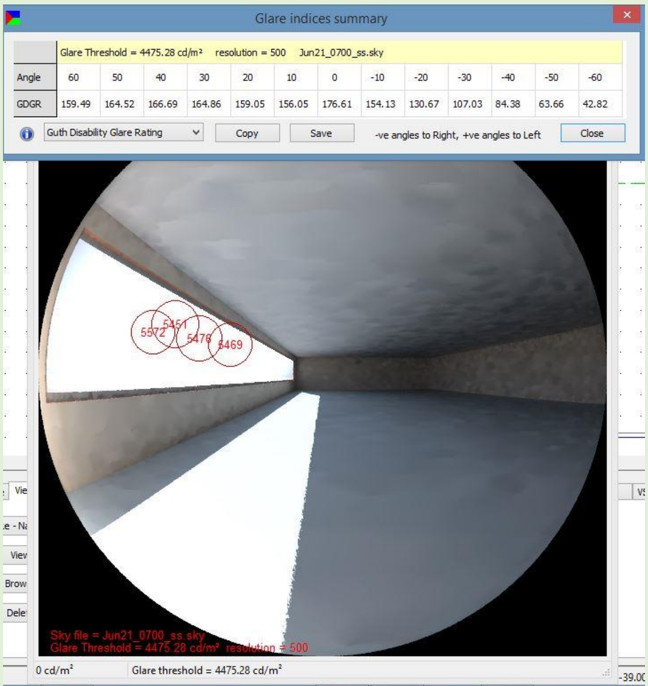


VCP	BRS
	

Glare indices summary
Glare Threshold = 4475.28 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 36.89 35.36 34.71 35.25 37.03 37.99 31.93 38.61 47.17 57.65 69.41 81.06 91.99
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
5572
5451
5476
5469
Sky file = Jun21_0700_ss.sky
Glare Threshold = 4475.28 cd/m² resolution = 500
0 cd/m²
Glare threshold = 4475.28 cd/m²

Glare indices summary
Glare Threshold = 4475.28 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 17.19 17.61 17.96 18.14 18.14 17.73 17.01 16.23 15.30 14.17 12.81 11.17 7.88
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
5572
5451
5476
5469
Sky file = Jun21_0700_ss.sky
Glare Threshold = 4475.28 cd/m² resolution = 500
0 cd/m²
Glare threshold = 4475.28 cd/m²

GDGR

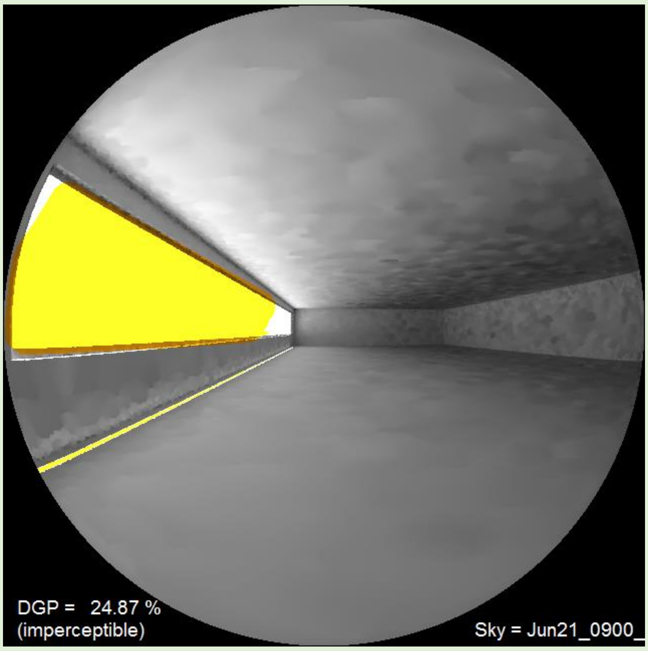


Glare indices summary
Glare Threshold = 4475.28 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 159.49 164.52 166.69 164.86 159.05 156.05 176.61 154.13 130.67 107.03 84.38 63.66 42.82
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
5572
5451
5476
5469
Sky file = Jun21_0700_ss.sky
Glare Threshold = 4475.28 cd/m² resolution = 500
0 cd/m²
Glare threshold = 4475.28 cd/m²

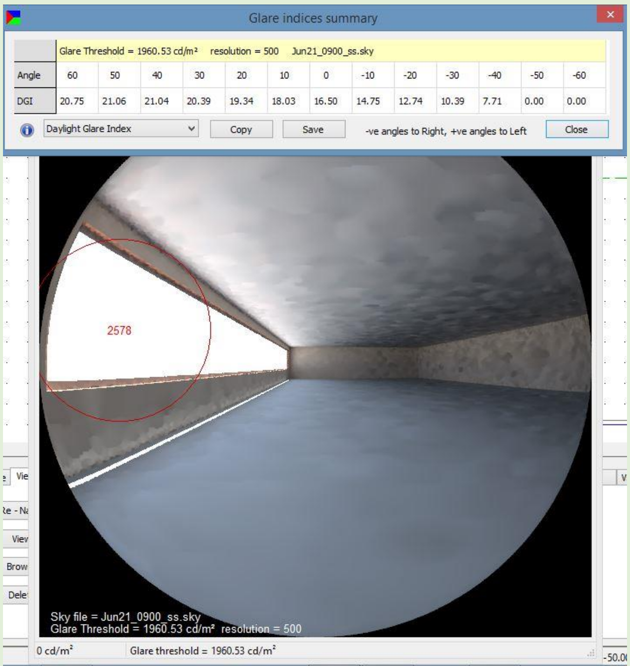
Table 209: Daylight and Glare Analysis for Jun 21, with sunny sky, (N), (P5/3m),(T9).

Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P5/3m) (T9).

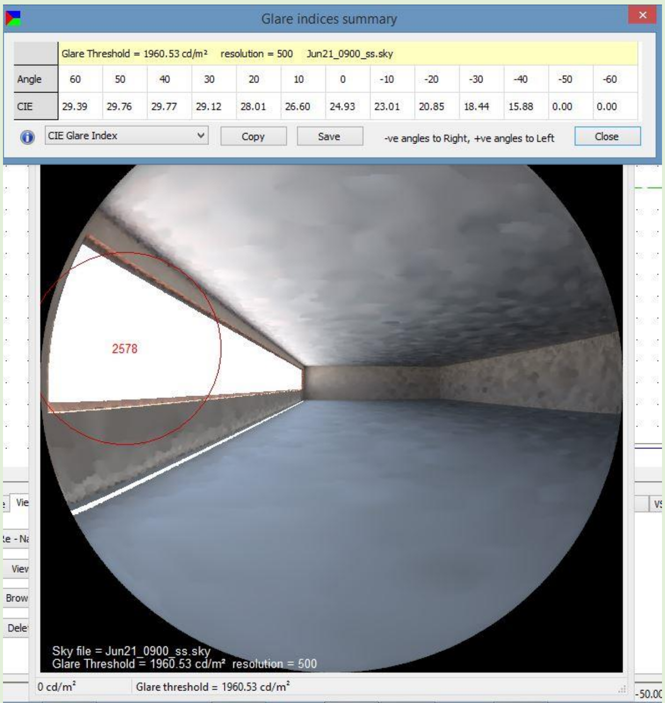
DGP



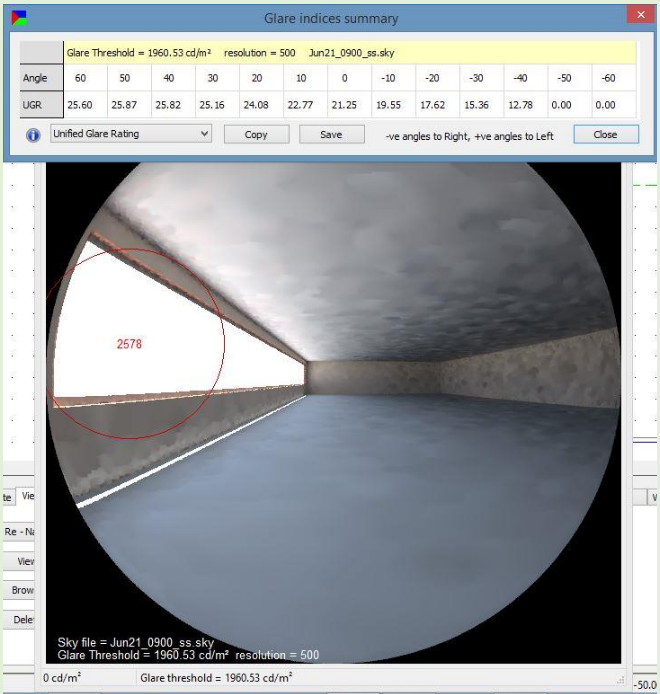
DGI



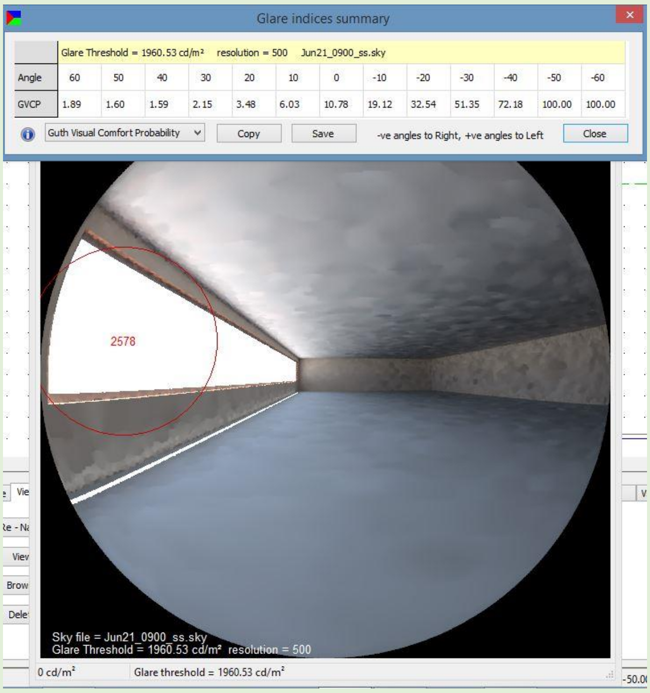
CGI



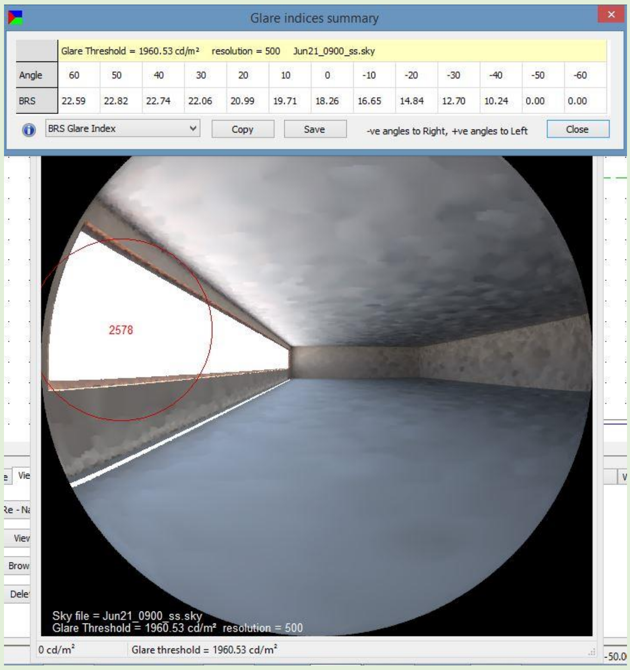
UGR



VCP


Glare indices summary
Glare Threshold = 1960.53 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 1.89 1.60 1.59 2.15 3.48 6.03 10.78 19.12 32.54 51.35 72.18 100.00 100.00
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2578
Sky file = Jun21_0900_ss.sky
Glare Threshold = 1960.53 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1960.53 cd/m²

BRS


Glare indices summary
Glare Threshold = 1960.53 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 22.59 22.82 22.74 22.06 20.99 19.71 18.26 16.65 14.84 12.70 10.24 0.00 0.00
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2578
Sky file = Jun21_0900_ss.sky
Glare Threshold = 1960.53 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1960.53 cd/m²

GDGR

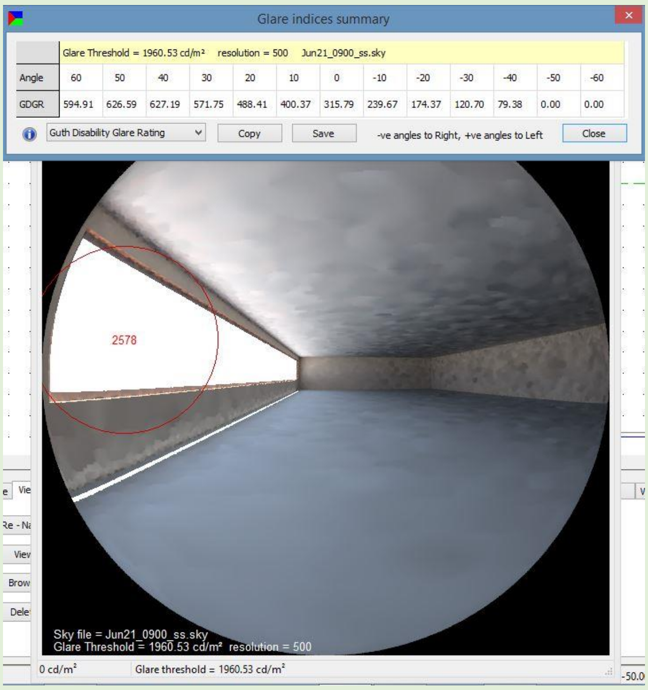
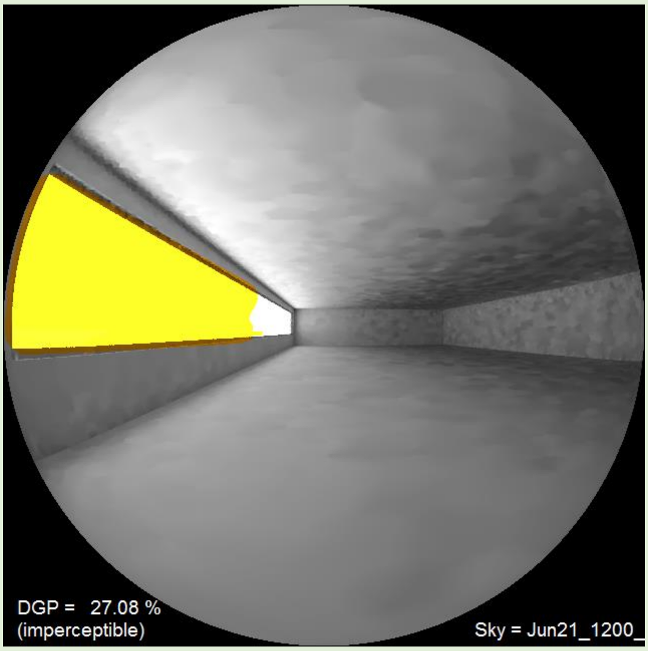

Glare indices summary
Glare Threshold = 1960.53 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 594.91 626.59 627.19 571.75 488.41 400.37 315.79 239.67 174.37 120.70 79.38 0.00 0.00
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2578
Sky file = Jun21_0900_ss.sky
Glare Threshold = 1960.53 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1960.53 cd/m²

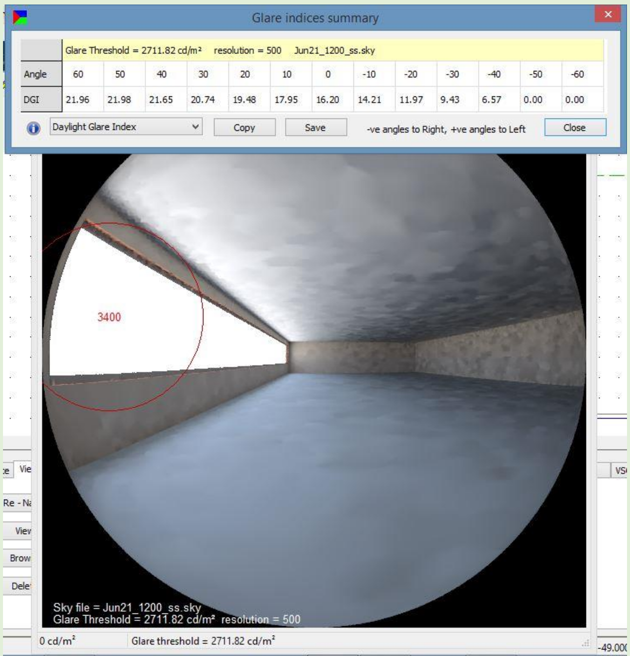
Table 210: Daylight and Glare Analysis for Jun 21, with sunny sky, (N), (P5/3m),(T12).

Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P5/3m) (T12).

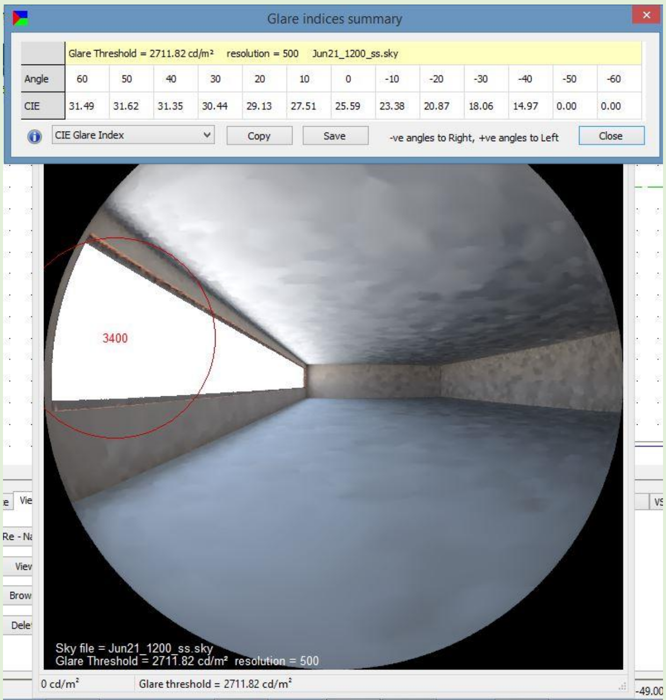
DGP



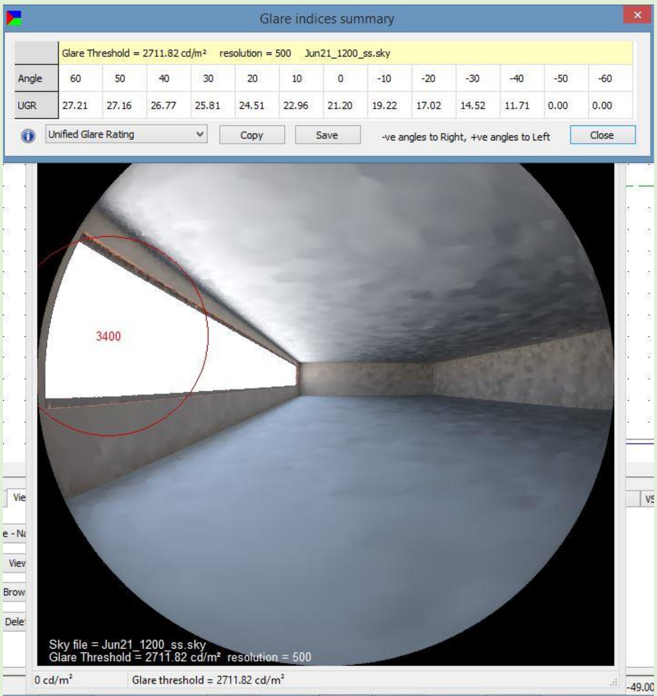
DGI



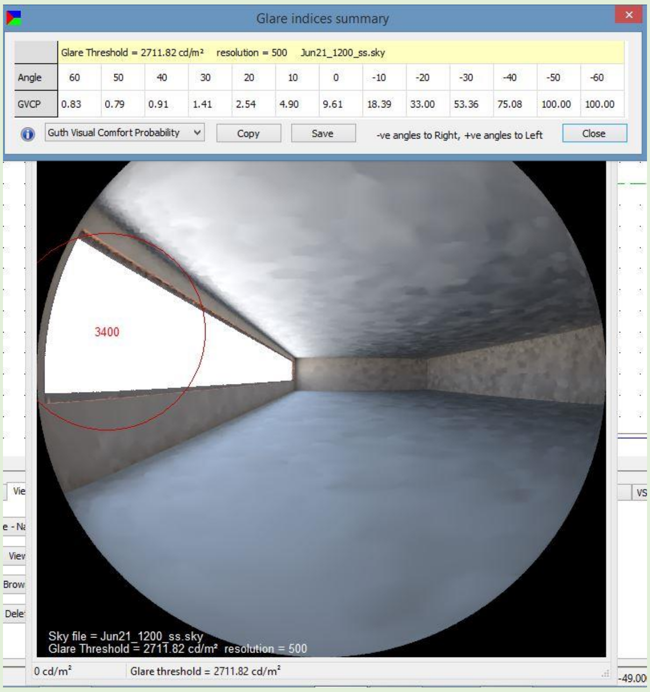
CGI



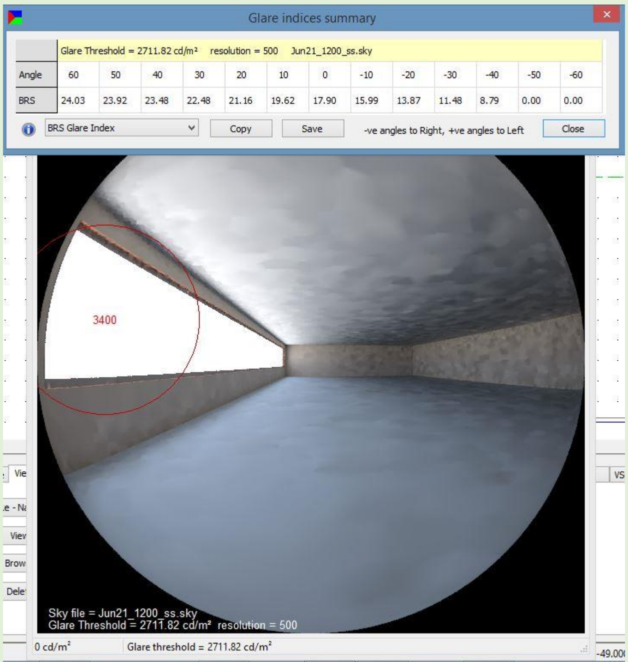
UGR



VCP


Glare indices summary
Glare Threshold = 2711.82 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 0.83 0.79 0.91 1.41 2.54 4.90 9.61 18.39 33.00 53.36 75.08 100.00 100.00
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3400
Sky file = Jun21_1200_ss.sky
Glare Threshold = 2711.82 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2711.82 cd/m²

BRS


Glare indices summary
Glare Threshold = 2711.82 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 24.03 23.92 23.48 22.48 21.16 19.62 17.90 15.99 13.87 11.48 8.79 0.00 0.00
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3400
Sky file = Jun21_1200_ss.sky
Glare Threshold = 2711.82 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2711.82 cd/m²

GDGR

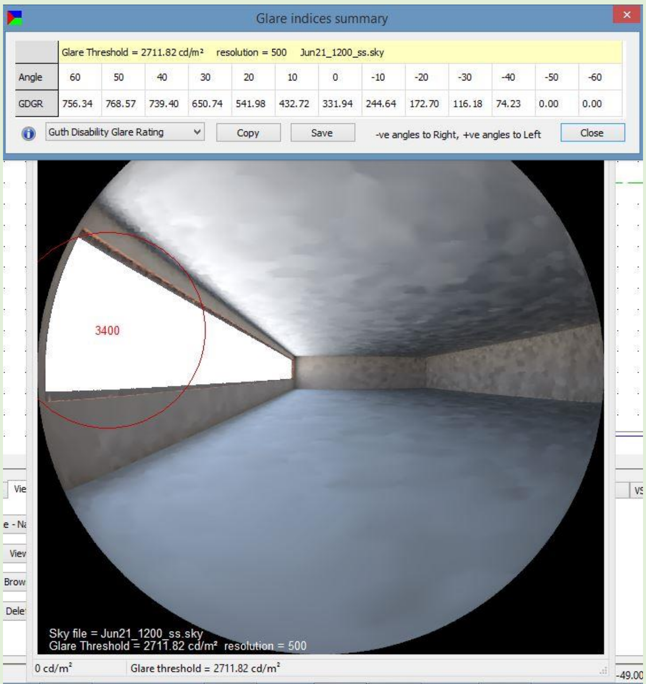
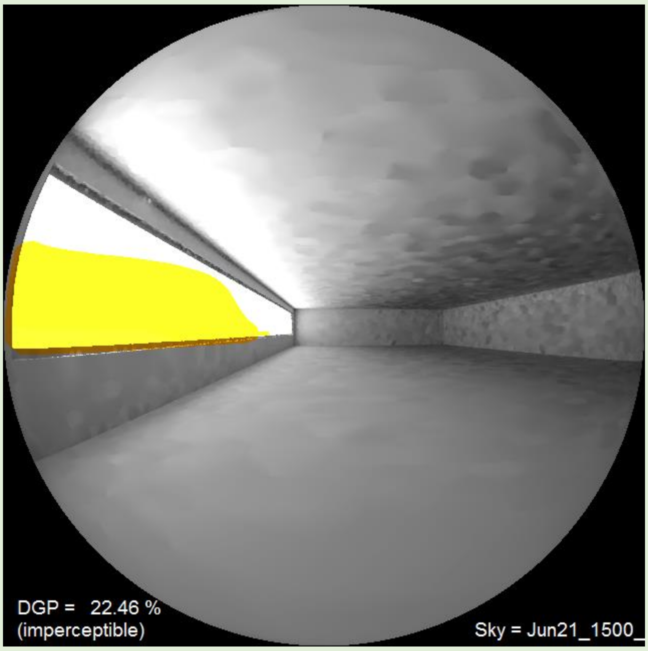

Glare indices summary
Glare Threshold = 2711.82 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 756.34 768.57 739.40 650.74 541.98 432.72 331.94 244.64 172.70 116.18 74.23 0.00 0.00
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3400
Sky file = Jun21_1200_ss.sky
Glare Threshold = 2711.82 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2711.82 cd/m²

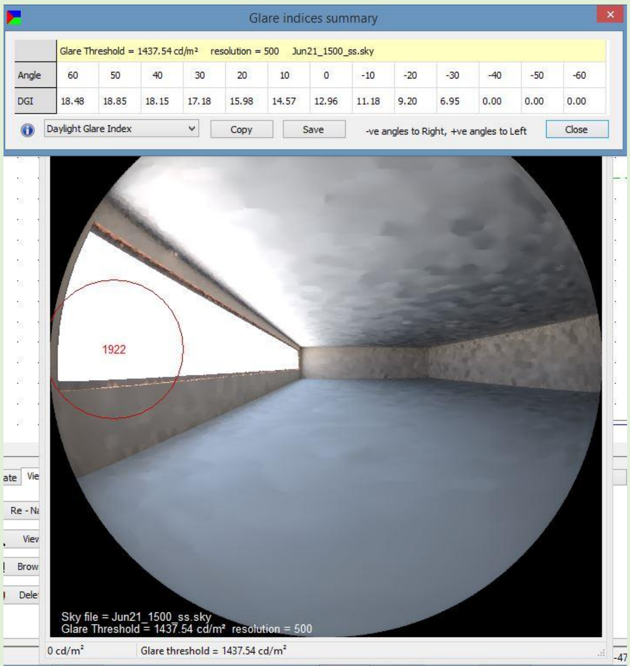
Table 211: Daylight and Glare Analysis for Jun 21, with sunny sky, (N), (P5/3m),(T15).

Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P5/3m) (T15).

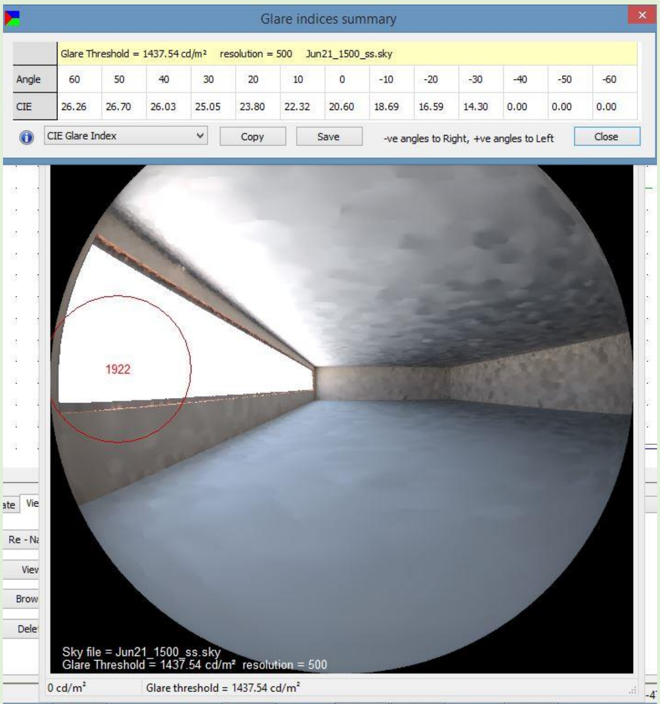
DGP



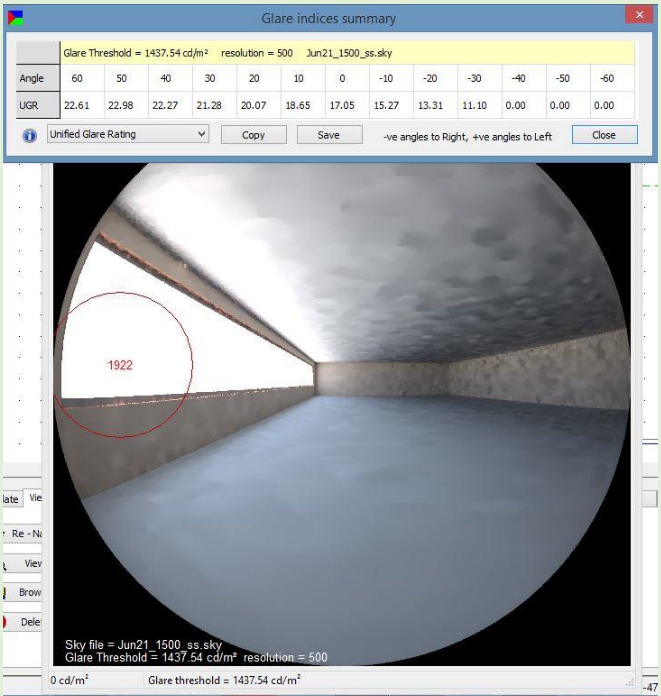
DGI

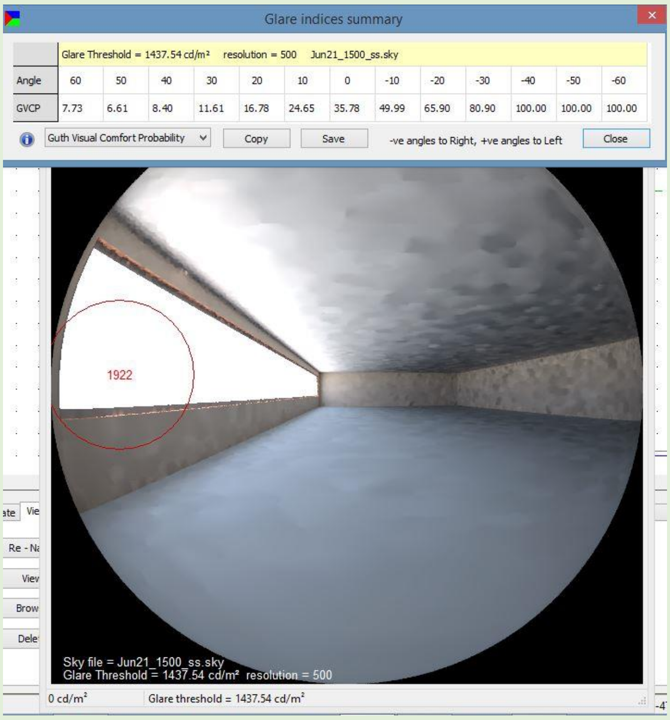
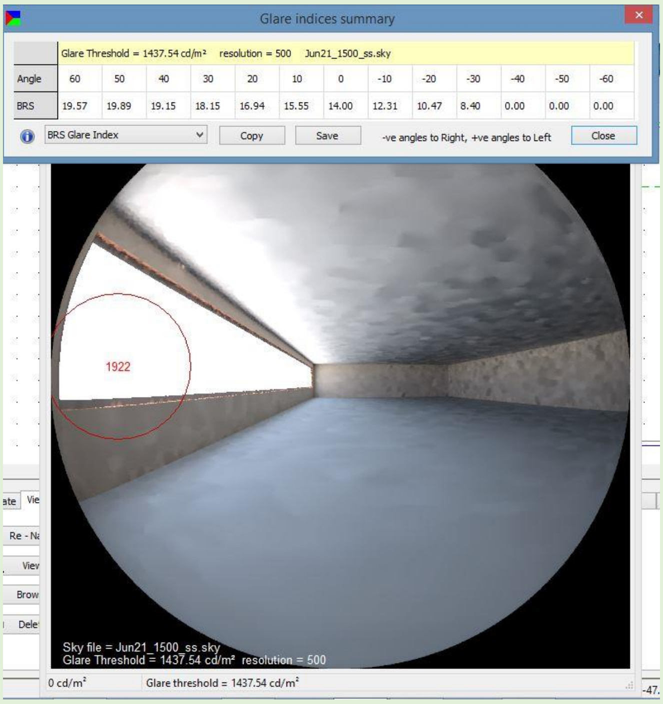


CGI



UGR

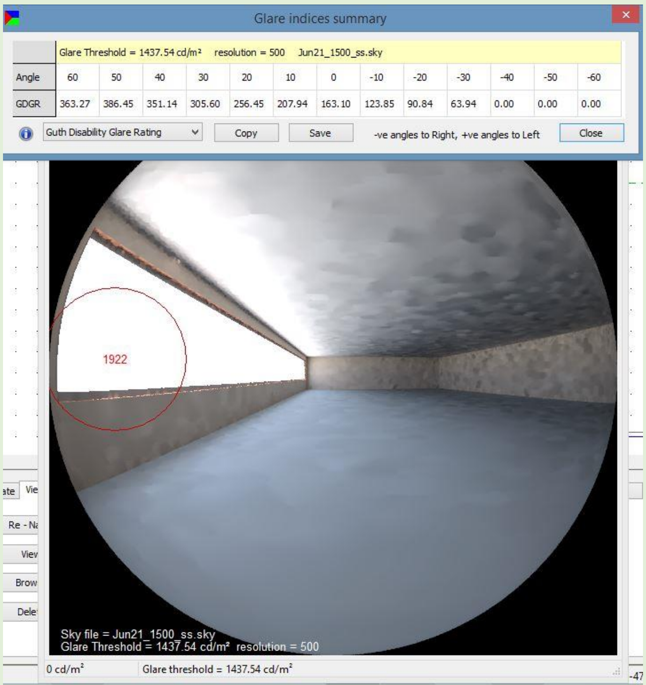


VCP	BRS
	

Glare indices summary
Glare Threshold = 1437.54 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 7.73 6.61 8.40 11.61 16.78 24.65 35.78 49.99 65.90 80.90 100.00 100.00 100.00
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1922
Sky file = Jun21_1500_ss.sky
Glare Threshold = 1437.54 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1437.54 cd/m²

Glare indices summary
Glare Threshold = 1437.54 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 19.57 19.89 19.15 18.15 16.94 15.55 14.00 12.31 10.47 8.40 0.00 0.00 0.00
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1922
Sky file = Jun21_1500_ss.sky
Glare Threshold = 1437.54 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1437.54 cd/m²

GDGR

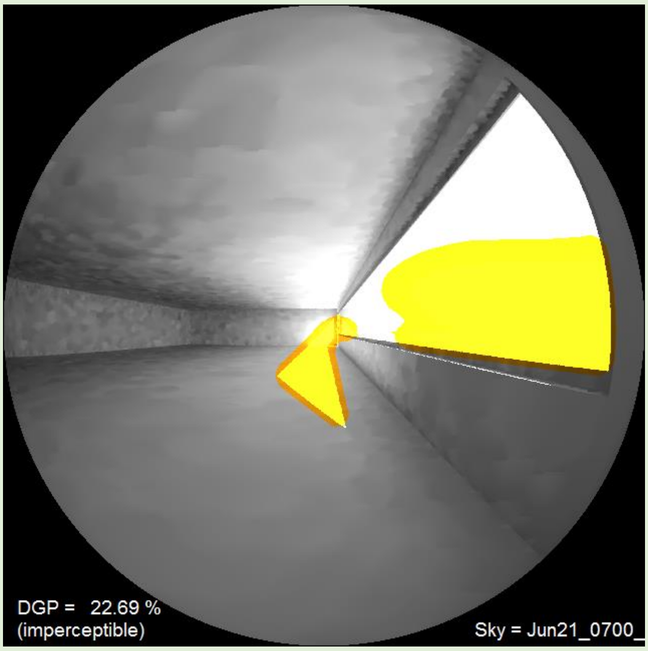


Glare indices summary
Glare Threshold = 1437.54 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 363.27 386.45 351.14 305.60 256.45 207.94 163.10 123.85 90.84 63.94 0.00 0.00 0.00
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1922
Sky file = Jun21_1500_ss.sky
Glare Threshold = 1437.54 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1437.54 cd/m²

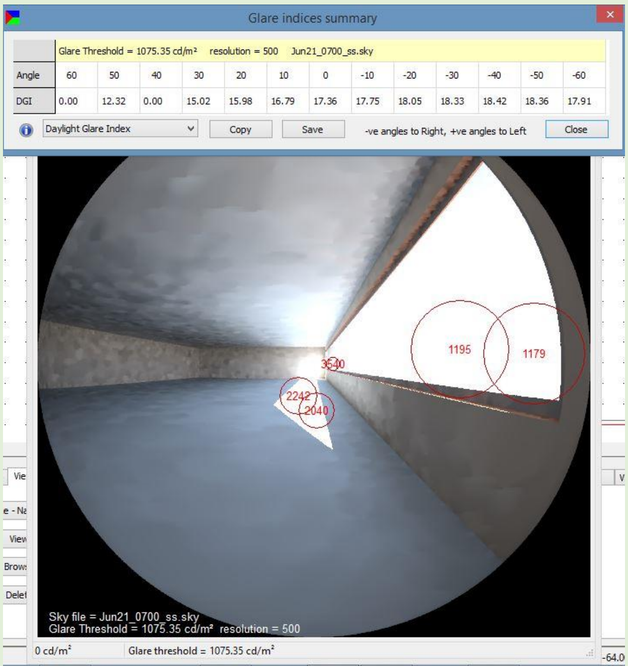
Table 212: Daylight and Glare Analysis for Jun 21, with sunny sky, (N), (P6/1.5m),(T7).

Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P6/1.5m) (T7).

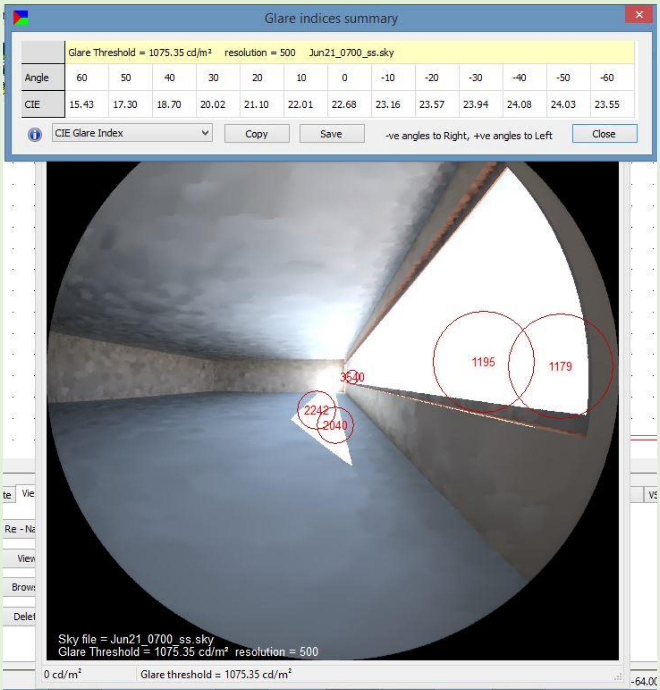
DGP



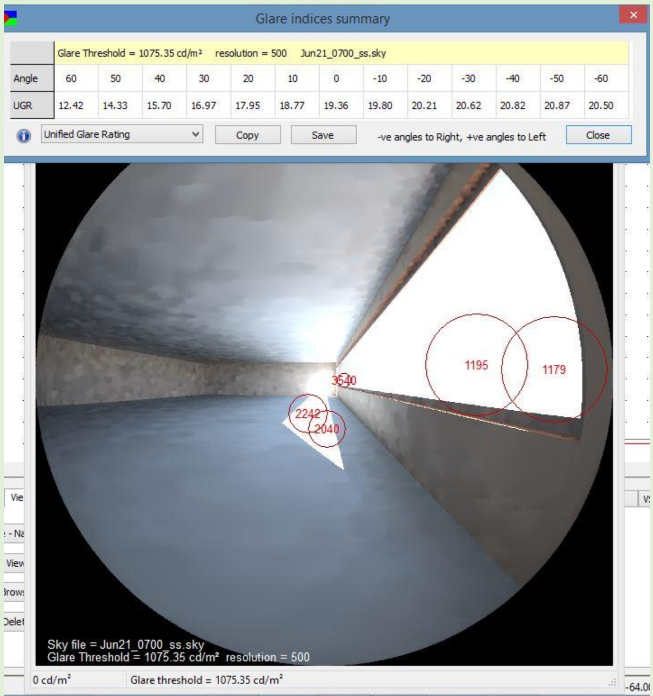
DGI



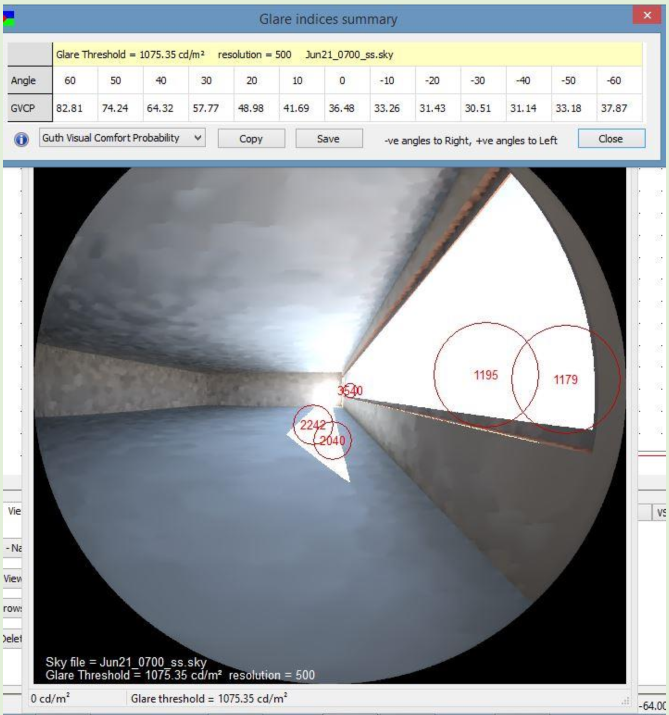
CGI



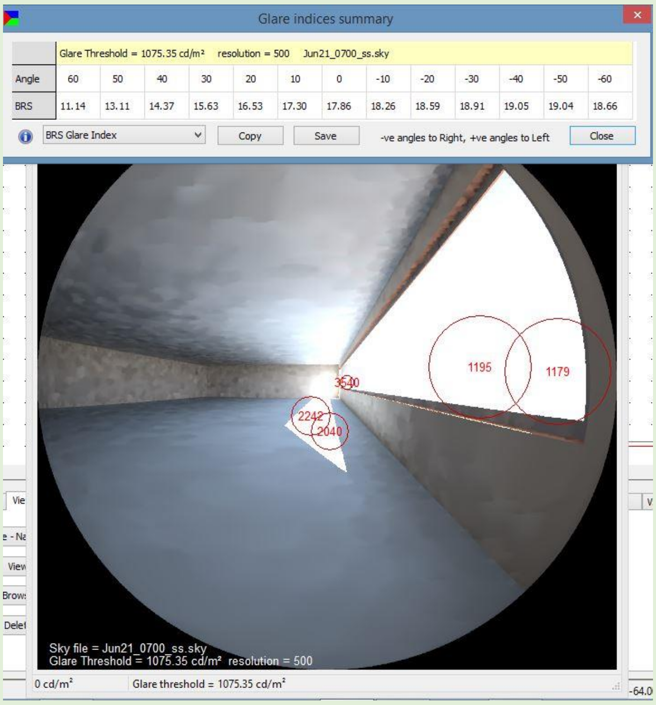
UGR



VCP


Glare indices summary
Glare Threshold = 1075.35 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 82.81 74.24 64.32 57.77 48.98 41.69 36.48 33.26 31.43 30.51 31.14 33.18 37.87
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3540
2242
2040
1195
1179
Sky file = Jun21_0700_ss.sky
Glare Threshold = 1075.35 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1075.35 cd/m²

BRS


Glare indices summary
Glare Threshold = 1075.35 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 11.14 13.11 14.37 15.63 16.53 17.30 17.86 18.26 18.59 18.91 19.05 19.04 18.66
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3540
2242
2040
1195
1179
Sky file = Jun21_0700_ss.sky
Glare Threshold = 1075.35 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1075.35 cd/m²

GDGR

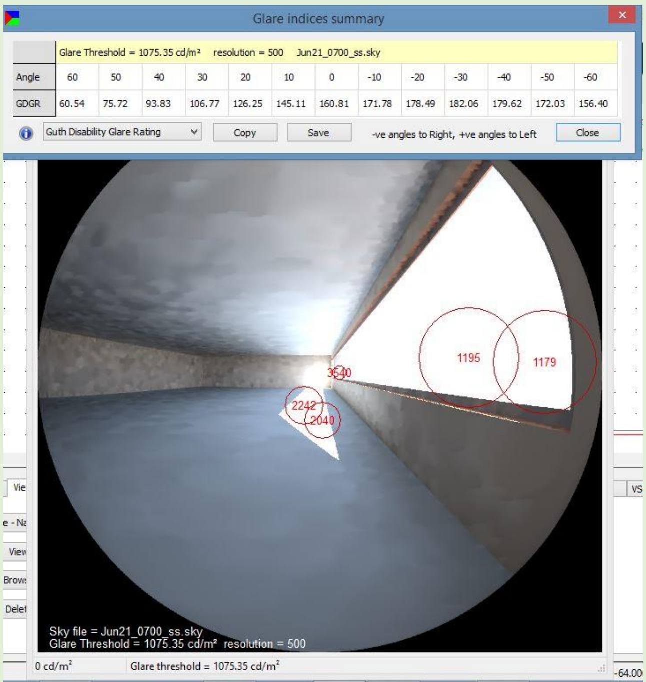
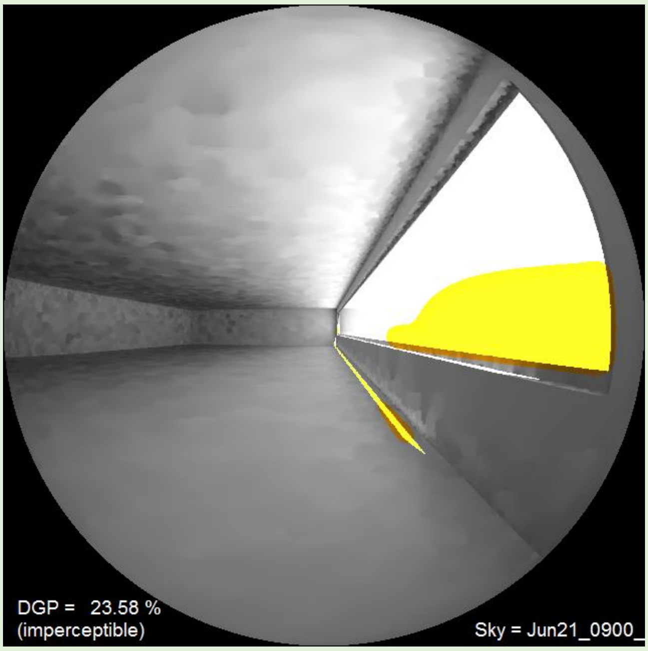

Glare indices summary
Glare Threshold = 1075.35 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 60.54 75.72 93.83 106.77 126.25 145.11 160.81 171.78 178.49 182.06 179.62 172.03 156.40
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3540
2242
2040
1195
1179
Sky file = Jun21_0700_ss.sky
Glare Threshold = 1075.35 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1075.35 cd/m²

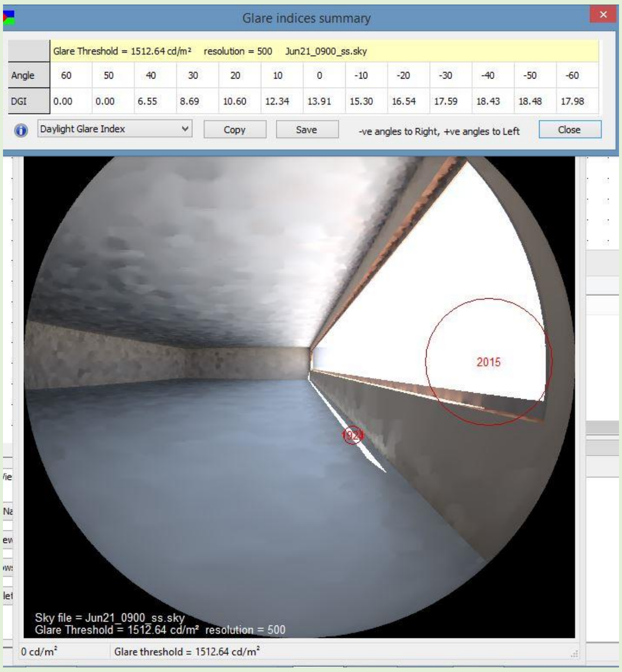
Table 213: Daylight and Glare Analysis for Jun 21, with sunny sky, (N), (P6/1.5m),(T9).

Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P6/1.5m) (T9).

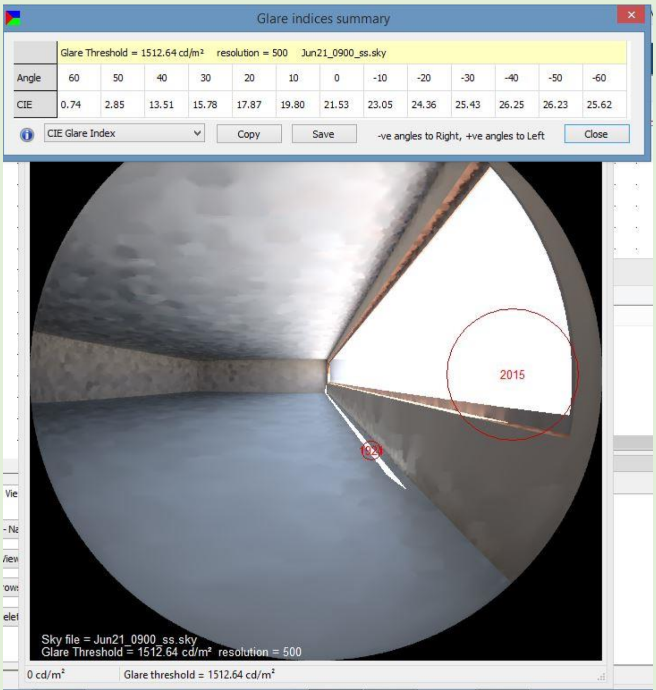
DGP



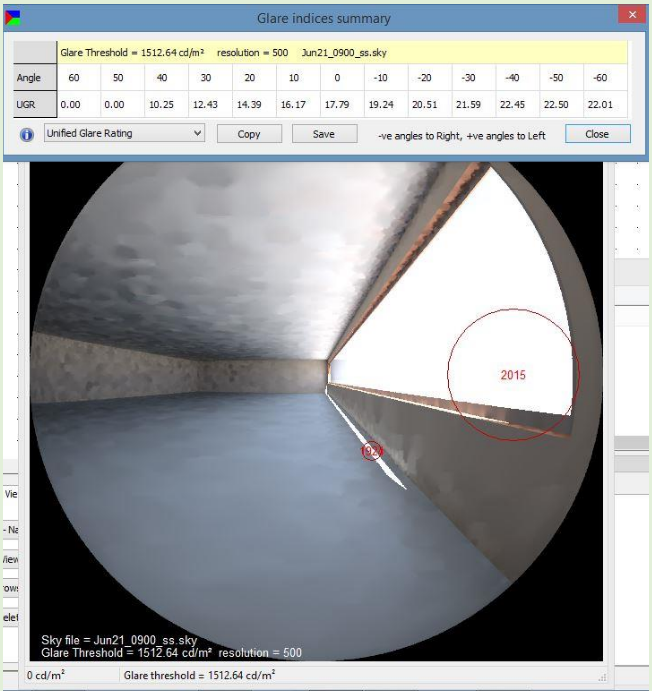
DGI



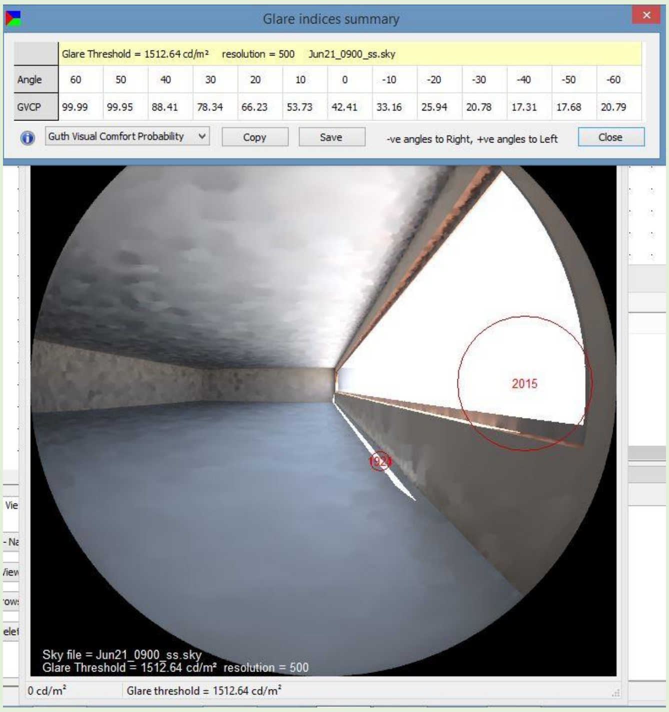
CGI



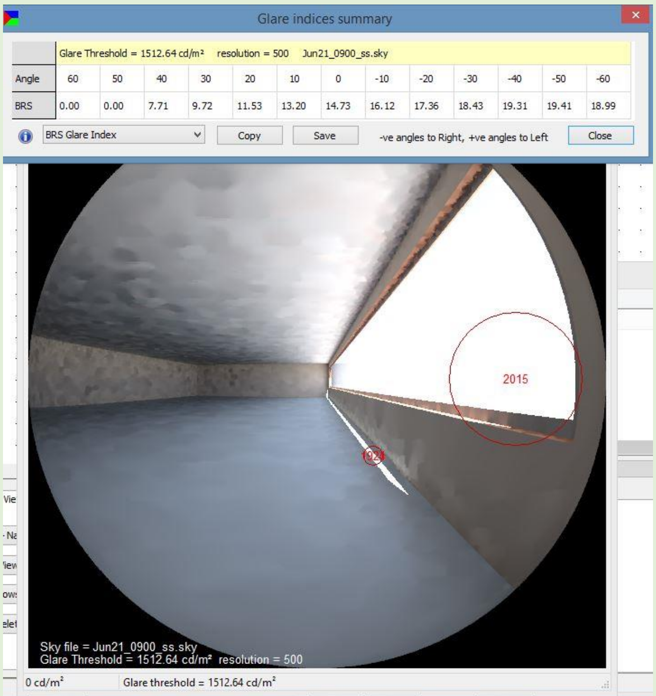
UGR



VCP


Glare indices summary
Glare Threshold = 1512.64 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 99.99 99.95 88.41 78.34 66.23 53.73 42.41 33.16 25.94 20.78 17.31 17.68 20.79
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2015
Sky file = Jun21_0900_ss.sky
Glare Threshold = 1512.64 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1512.64 cd/m²

BRS


Glare indices summary
Glare Threshold = 1512.64 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 0.00 0.00 7.71 9.72 11.53 13.20 14.73 16.12 17.36 18.43 19.31 19.41 18.99
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2015
Sky file = Jun21_0900_ss.sky
Glare Threshold = 1512.64 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1512.64 cd/m²

GDGR

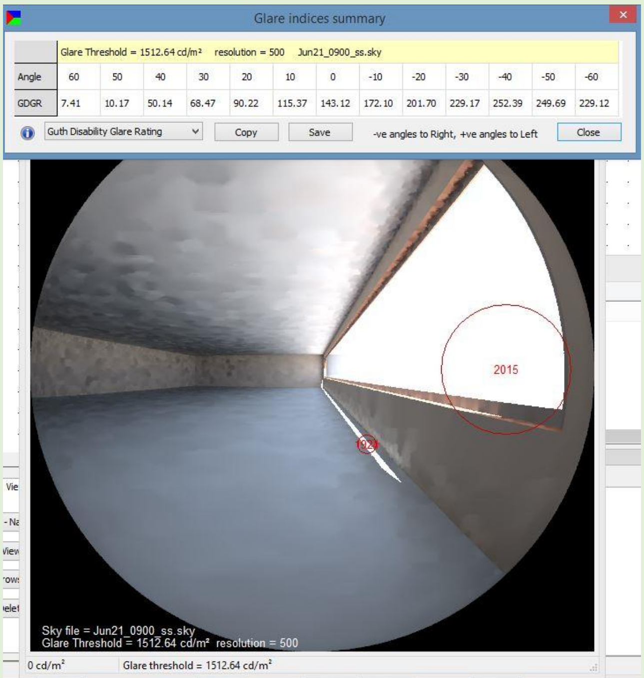
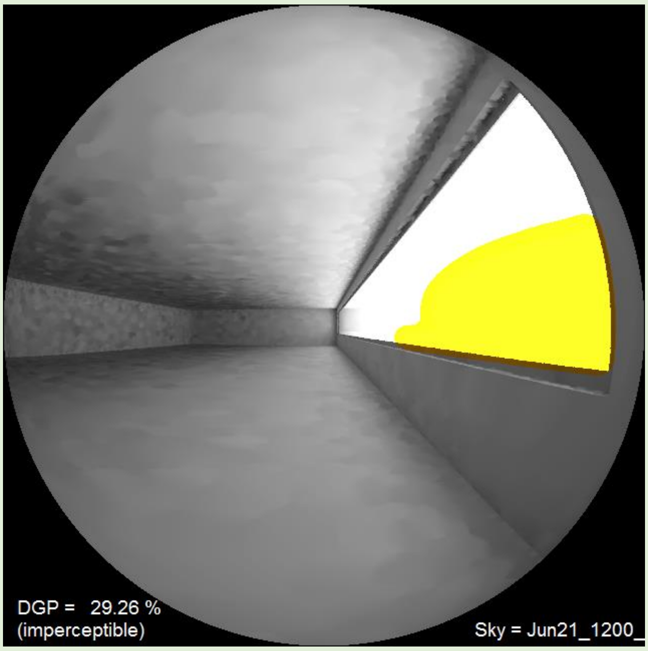

Glare indices summary
Glare Threshold = 1512.64 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 7.41 10.17 50.14 68.47 90.22 115.37 143.12 172.10 201.70 229.17 252.39 249.69 229.12
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2015
Sky file = Jun21_0900_ss.sky
Glare Threshold = 1512.64 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1512.64 cd/m²

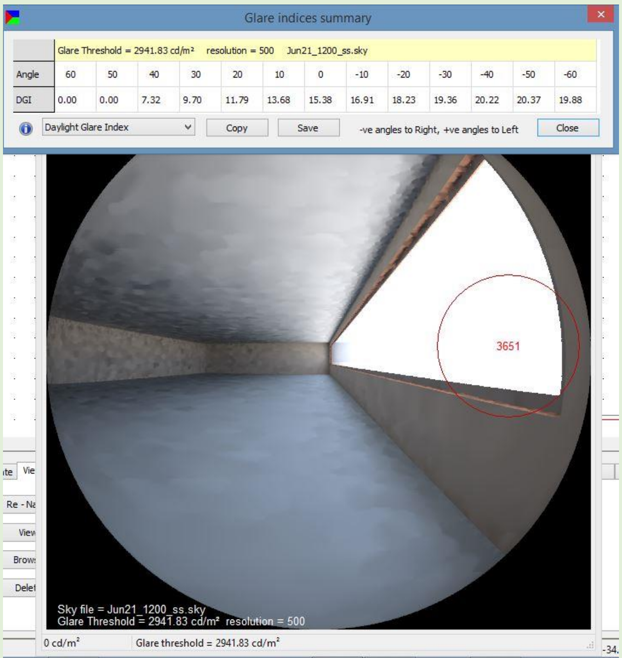
Table 214: Daylight and Glare Analysis for Jun 21, with sunny sky, (N), (P6/1.5m),(T12).

Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P6/1.5m) (T12).

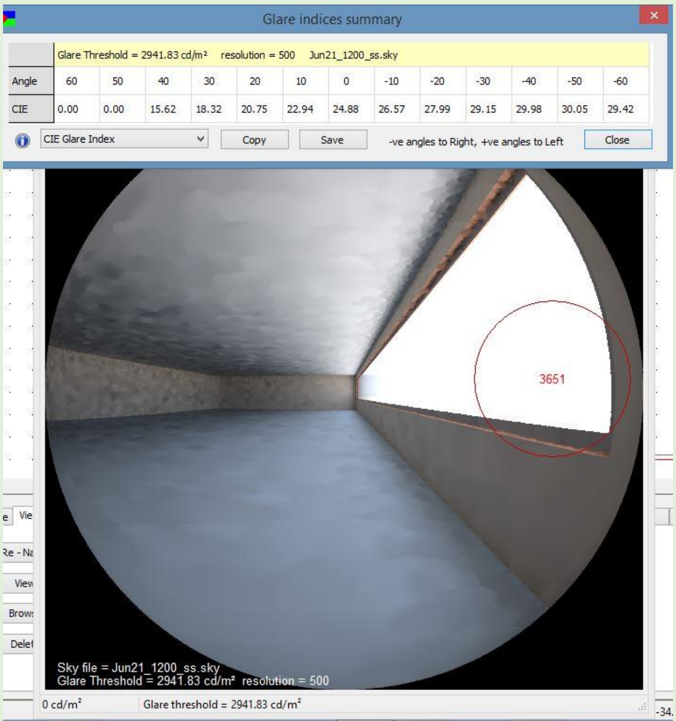
DGP



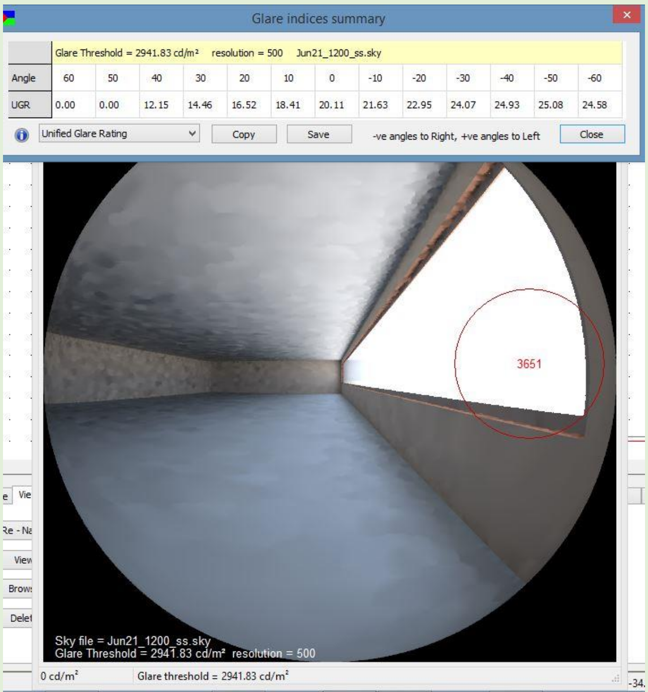
DGI

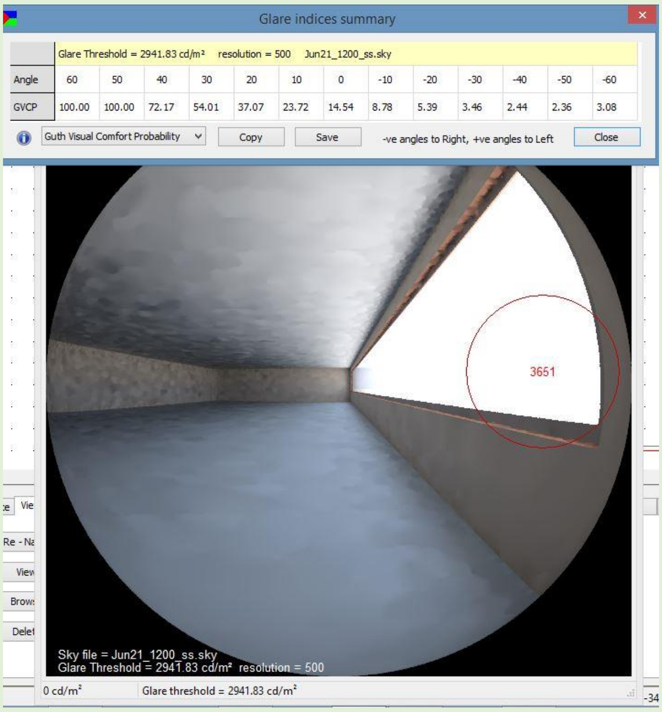
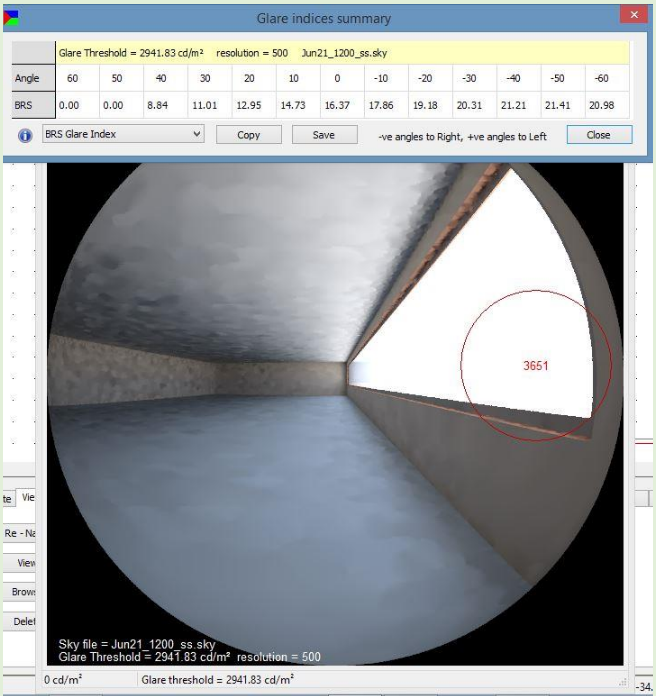


CGI



UGR

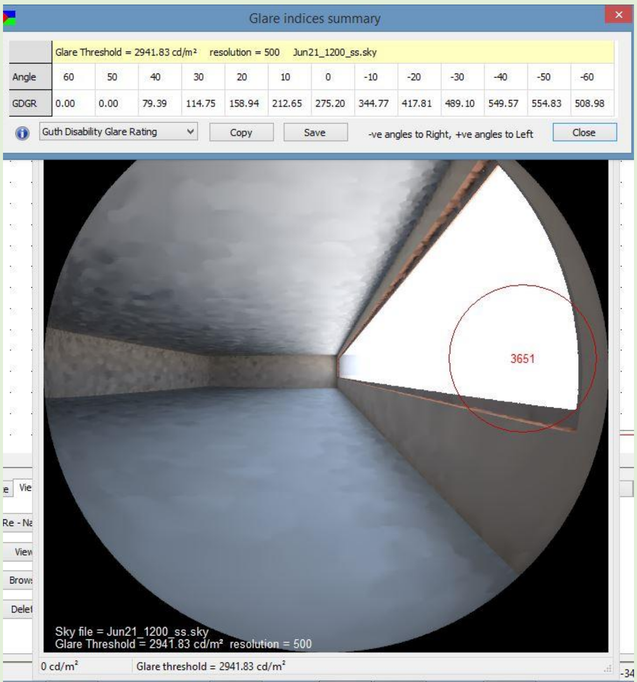


VCP	BRS
	

Glare indices summary
Glare Threshold = 2941.83 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 100.00 100.00 72.17 54.01 37.07 23.72 14.54 8.78 5.39 3.46 2.44 2.36 3.08
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3651
Sky file = Jun21_1200_ss.sky
Glare Threshold = 2941.83 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2941.83 cd/m²

Glare indices summary
Glare Threshold = 2941.83 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 0.00 0.00 8.84 11.01 12.95 14.73 16.37 17.86 19.18 20.31 21.21 21.41 20.98
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3651
Sky file = Jun21_1200_ss.sky
Glare Threshold = 2941.83 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2941.83 cd/m²

GDGR

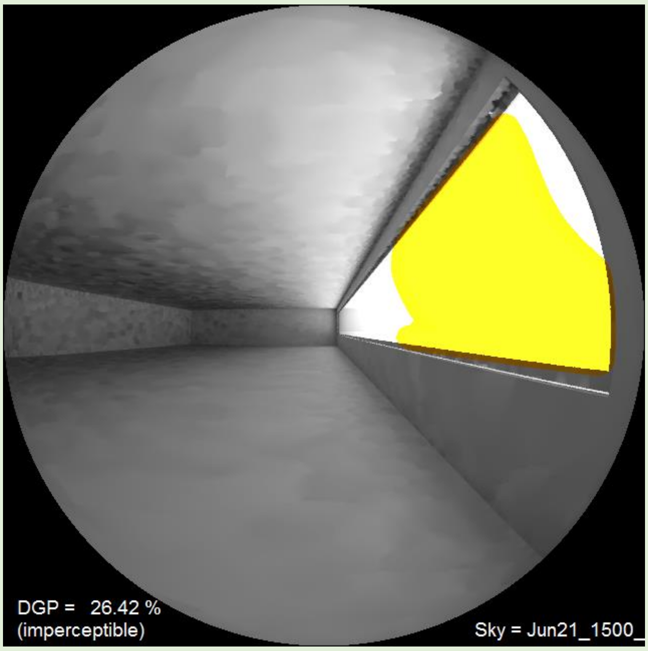


Glare indices summary
Glare Threshold = 2941.83 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 0.00 0.00 79.39 114.75 158.94 212.65 275.20 344.77 417.81 489.10 549.57 554.83 508.98
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3651
Sky file = Jun21_1200_ss.sky
Glare Threshold = 2941.83 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2941.83 cd/m²

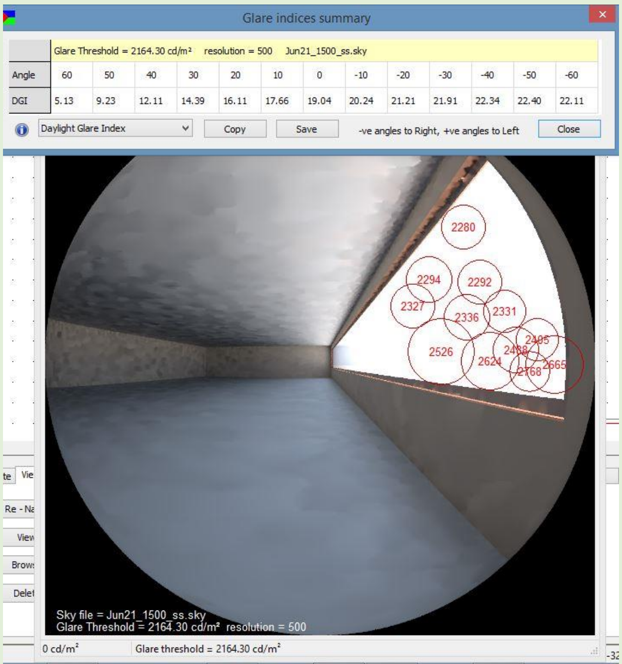
Table 215: Daylight and Glare Analysis for Jun 21, with sunny sky, (N), (P6/1.5m),(T15).

Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P6/1.5m) (T15).

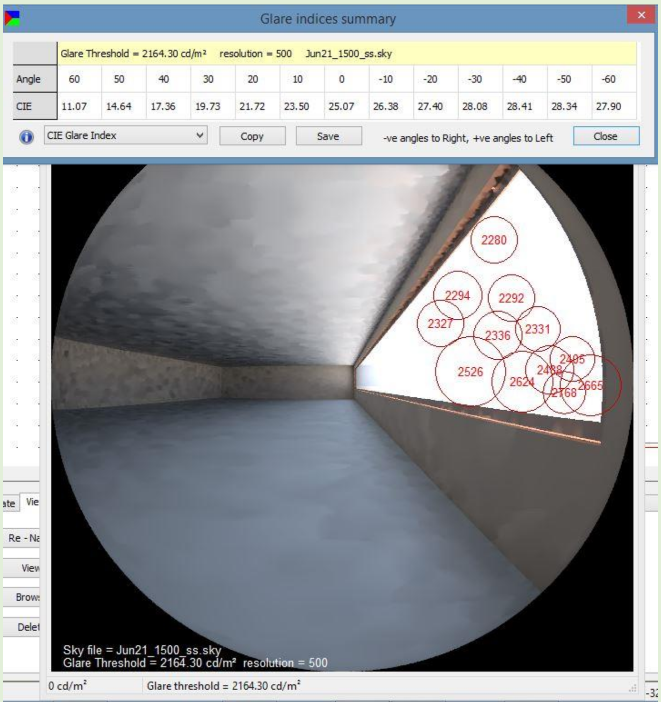
DGP



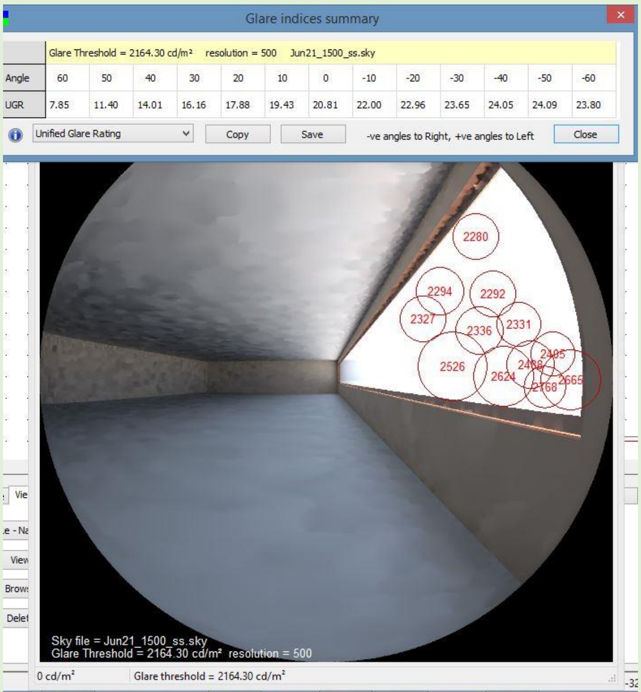
DGI

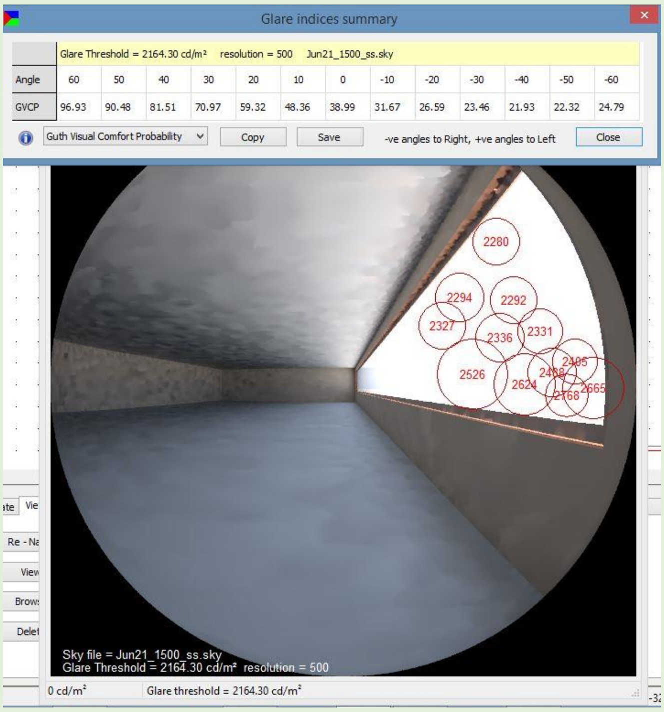
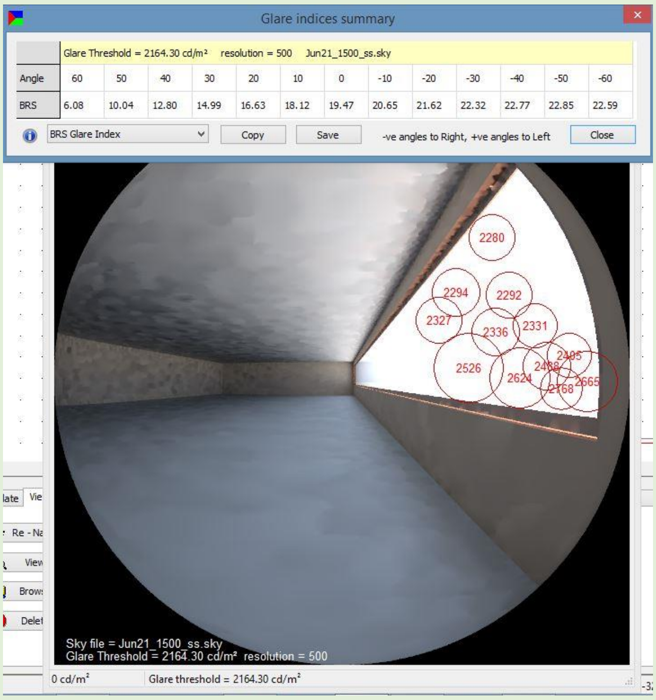


CGI



UGR

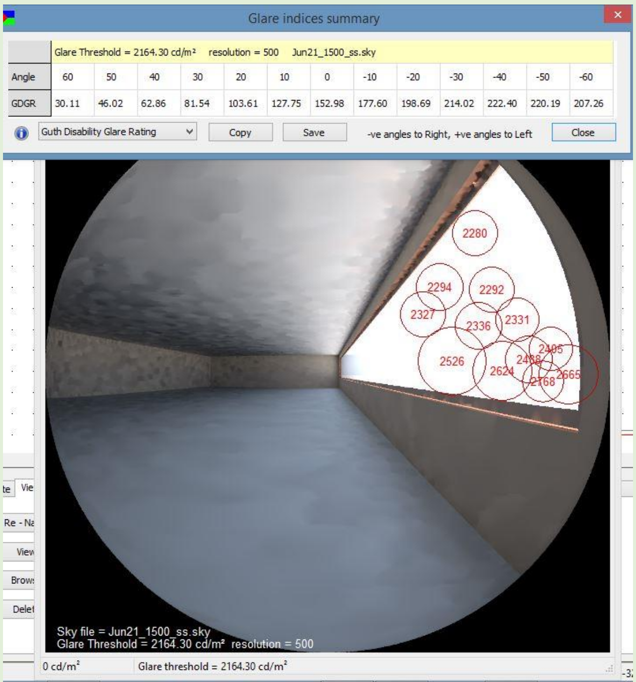


VCP	BRS
	

Glare indices summary
Glare Threshold = 2164.30 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 96.93 90.48 81.51 70.97 59.32 48.36 38.99 31.67 26.59 23.46 21.93 22.32 24.79
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_1500_ss.sky
Glare Threshold = 2164.30 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2164.30 cd/m²

Glare indices summary
Glare Threshold = 2164.30 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 6.08 10.04 12.80 14.99 16.63 18.12 19.47 20.65 21.62 22.32 22.77 22.85 22.59
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_1500_ss.sky
Glare Threshold = 2164.30 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2164.30 cd/m²

GDGR

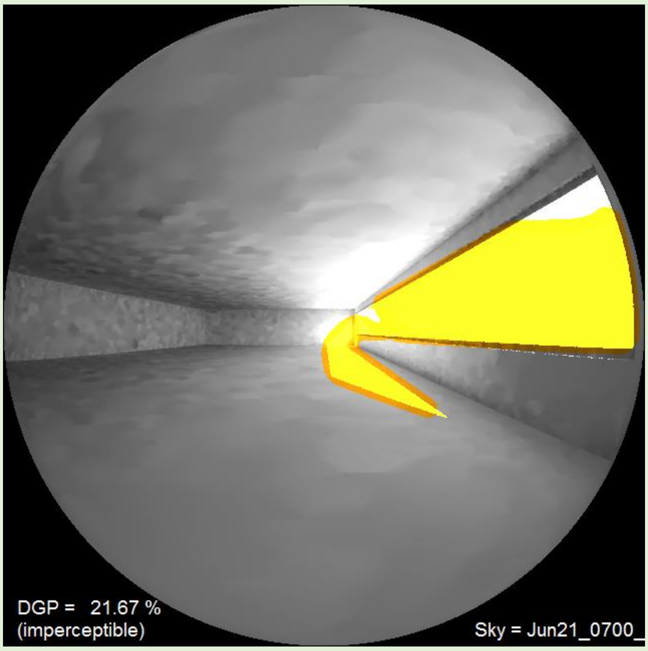


Glare indices summary
Glare Threshold = 2164.30 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 30.11 46.02 62.86 81.54 103.61 127.75 152.98 177.60 198.69 214.02 222.40 220.19 207.26
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_1500_ss.sky
Glare Threshold = 2164.30 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2164.30 cd/m²

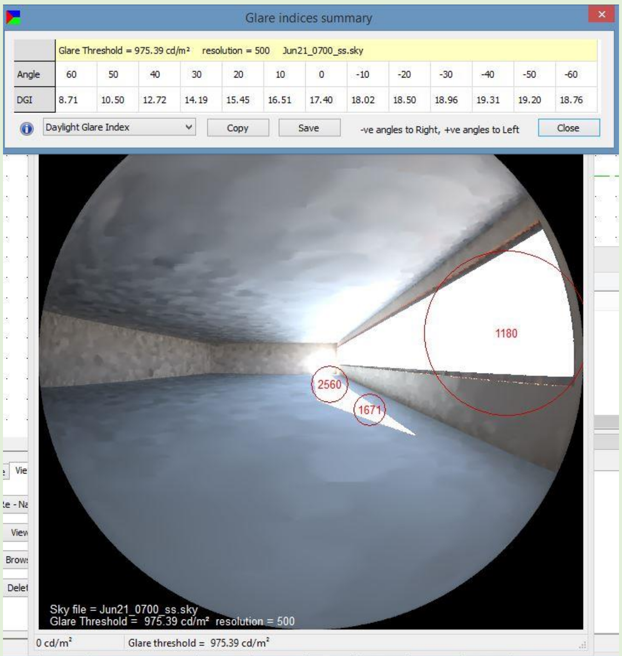
Table 216: Daylight and Glare Analysis for Jun 21, with sunny sky, (N), (P6/3m),(T7).

Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P6/3m) (T7).

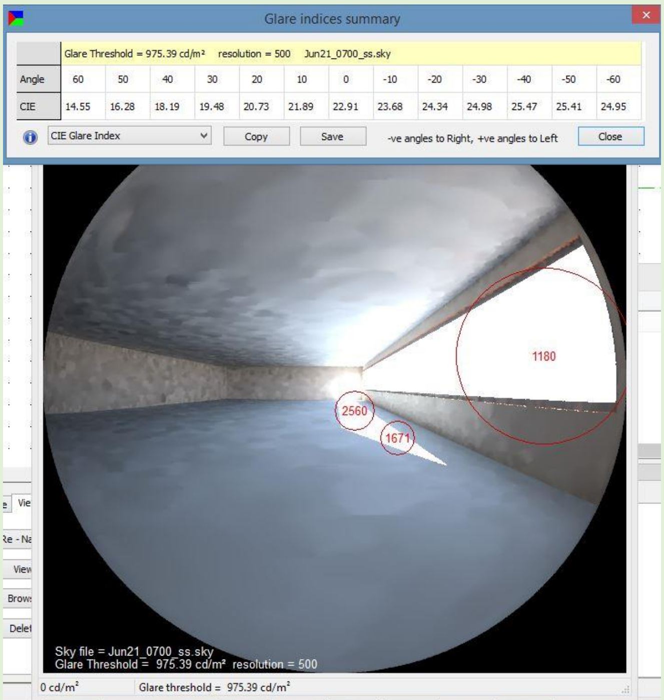
DGP



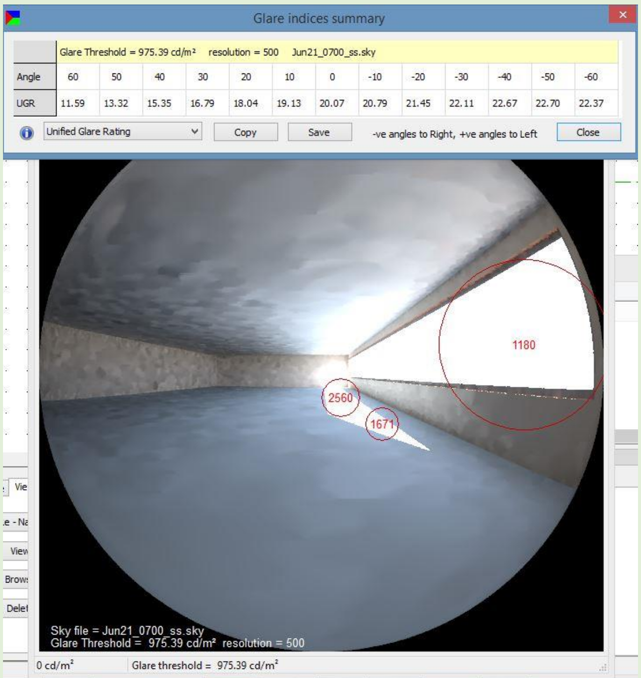
DGI



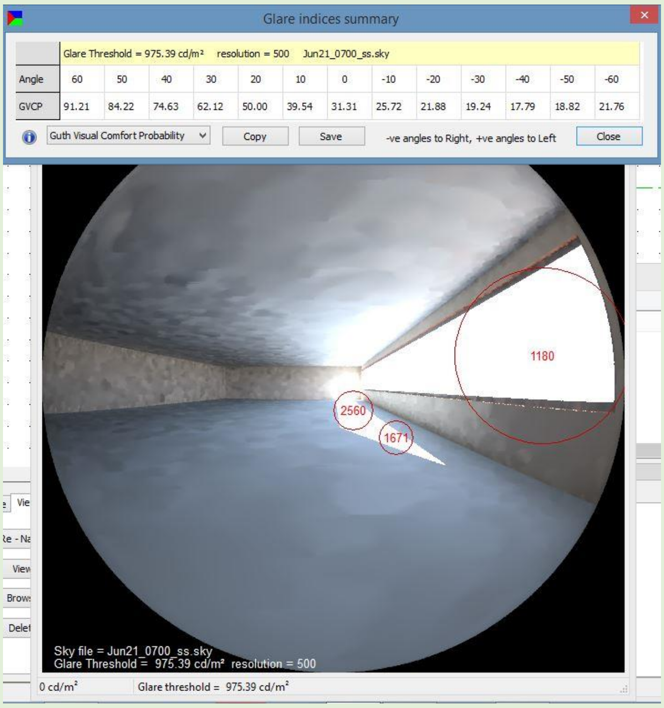
CGI



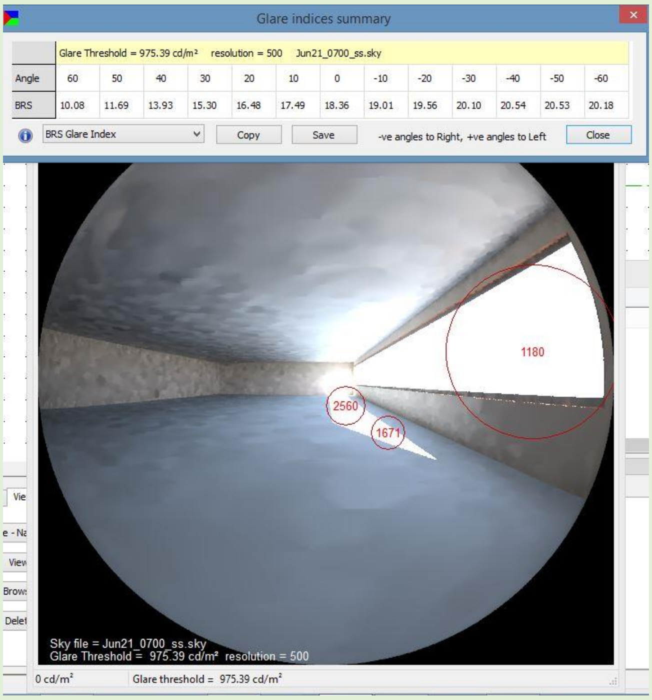
UGR



VCP


Glare indices summary
Glare Threshold = 975.39 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 91.21 84.22 74.63 62.12 50.00 39.54 31.31 25.72 21.88 19.24 17.79 18.82 21.76
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1180
2560
1671
Sky file = Jun21_0700_ss.sky
Glare Threshold = 975.39 cd/m² resolution = 500
0 cd/m²
Glare threshold = 975.39 cd/m²

BRS


Glare indices summary
Glare Threshold = 975.39 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 10.08 11.69 13.93 15.30 16.48 17.49 18.36 19.01 19.56 20.10 20.54 20.53 20.18
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1180
2560
1671
Sky file = Jun21_0700_ss.sky
Glare Threshold = 975.39 cd/m² resolution = 500
0 cd/m²
Glare threshold = 975.39 cd/m²

GDGR

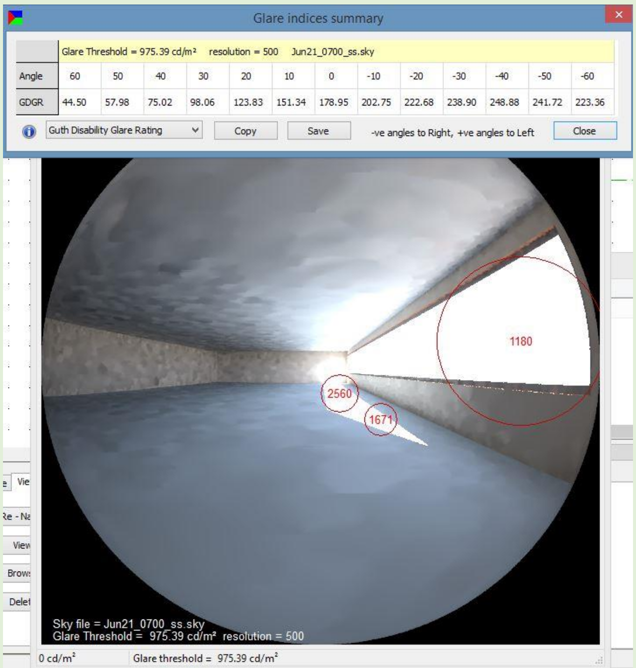
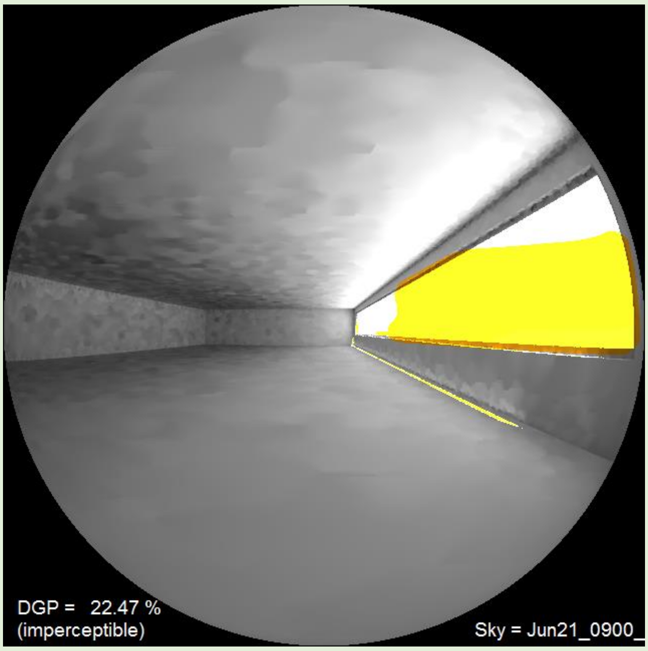

Glare indices summary
Glare Threshold = 975.39 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 44.50 57.98 75.02 98.06 123.83 151.34 178.95 202.75 222.68 238.90 248.88 241.72 223.36
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1180
2560
1671
Sky file = Jun21_0700_ss.sky
Glare Threshold = 975.39 cd/m² resolution = 500
0 cd/m²
Glare threshold = 975.39 cd/m²

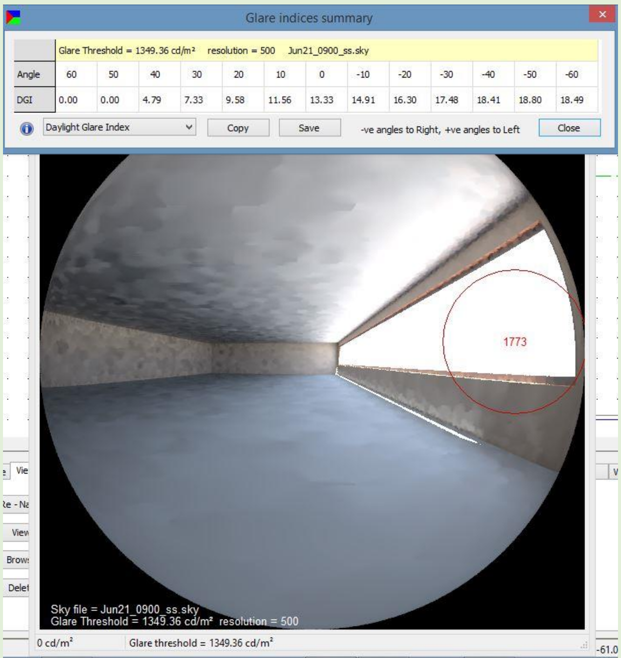
Table 217: Daylight and Glare Analysis for Jun 21, with sunny sky, (N), (P6/3m),(T9).

Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P6/3m) (T9).

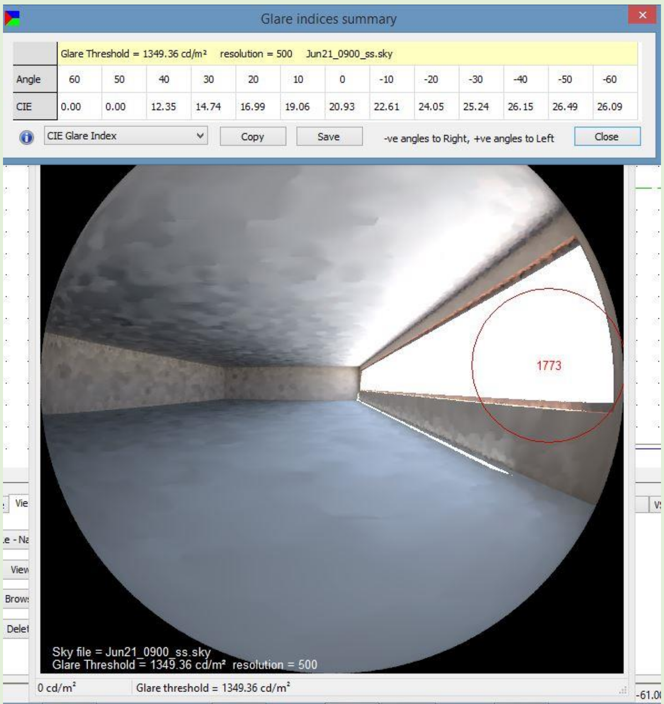
DGP



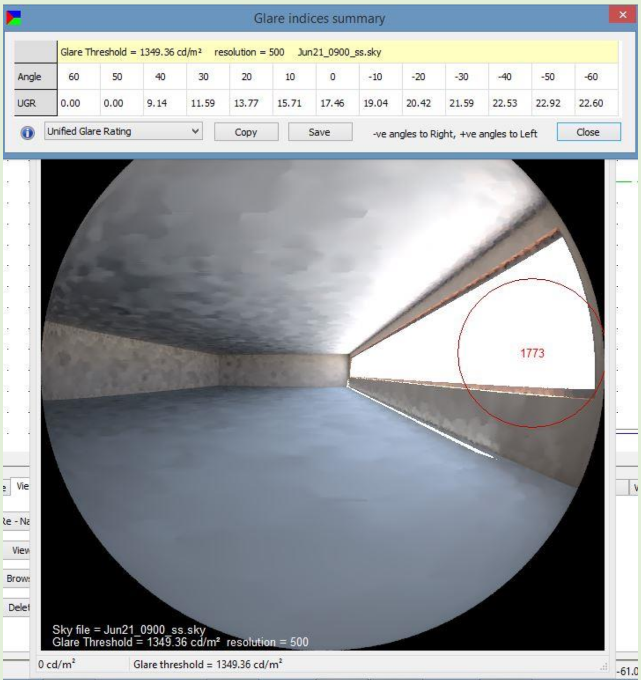
DGI



CGI

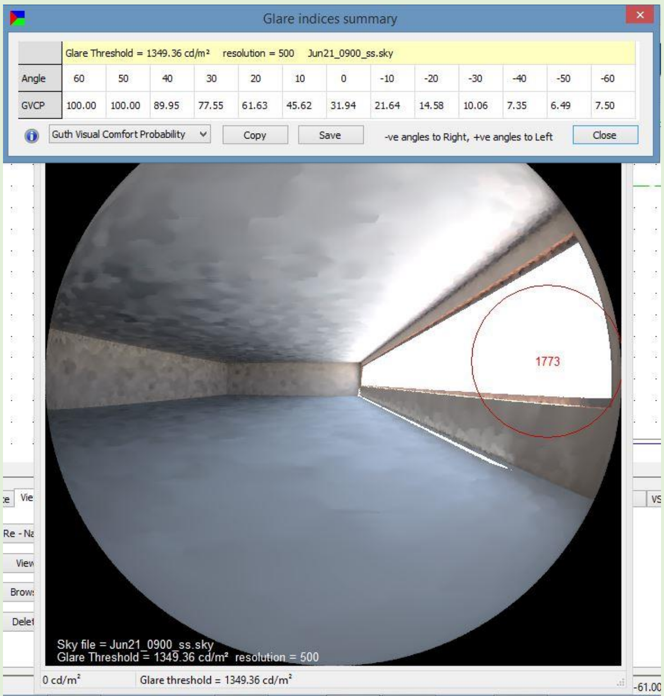


UGR

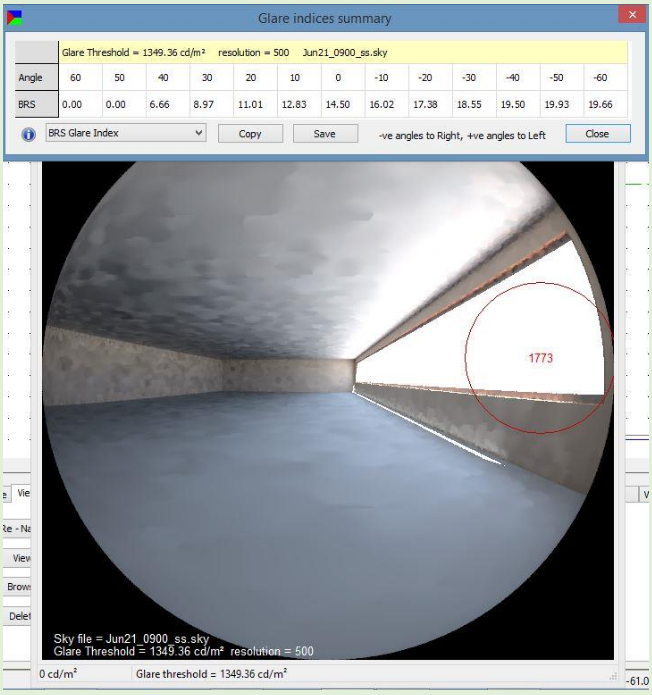


VCP	BRS

VCP



BRS



GDGR

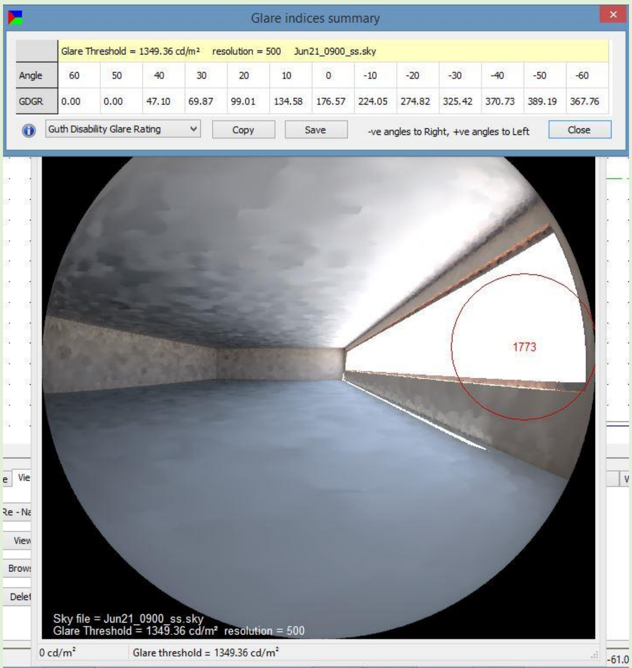
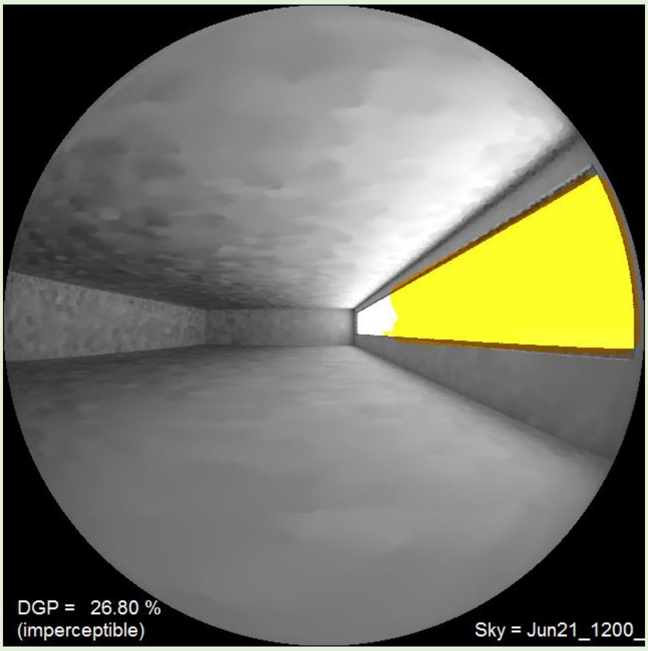


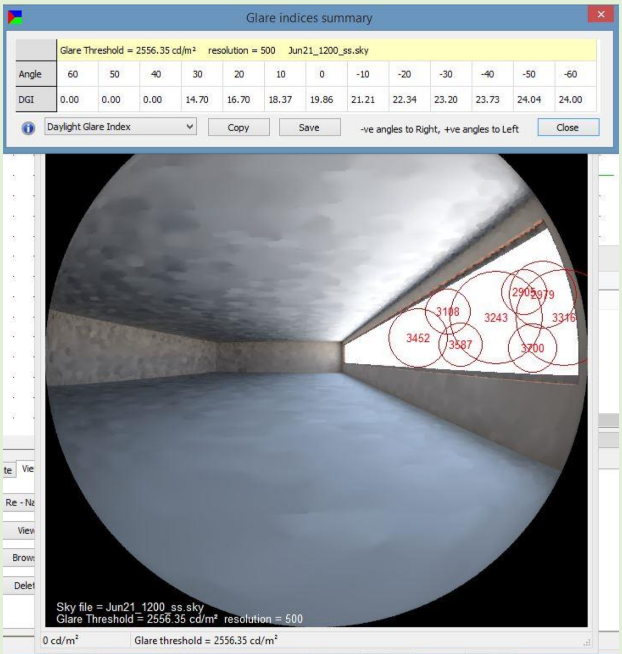
Table 218: Daylight and Glare Analysis for Jun 21, with sunny sky, (N), (P6/3m),(T12).

Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P6/3m) (T12).

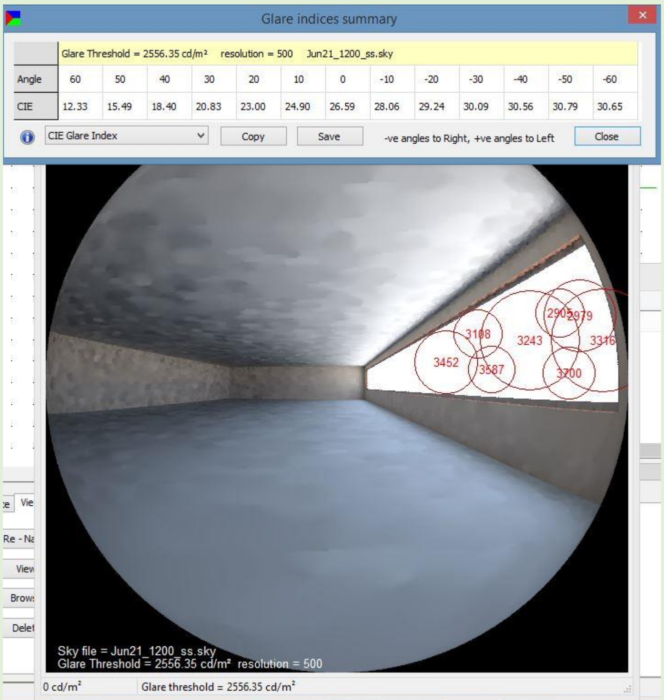
DGP



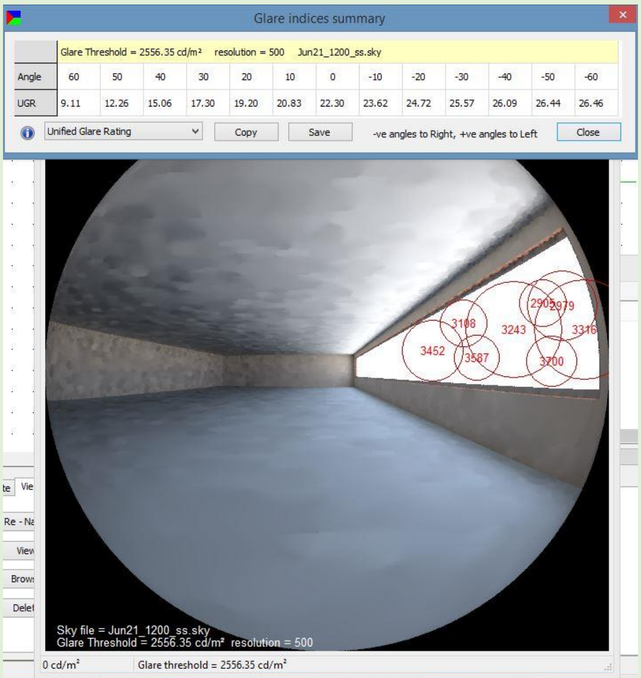
DGI



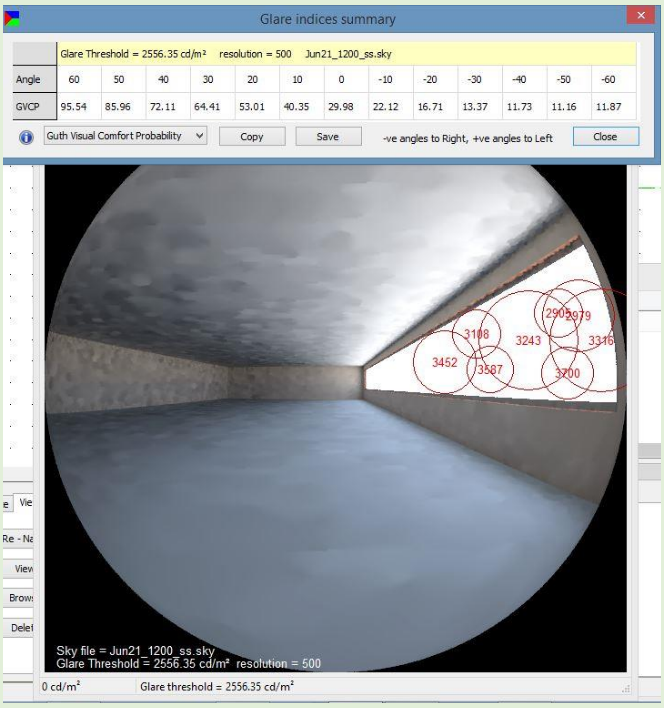
CGI



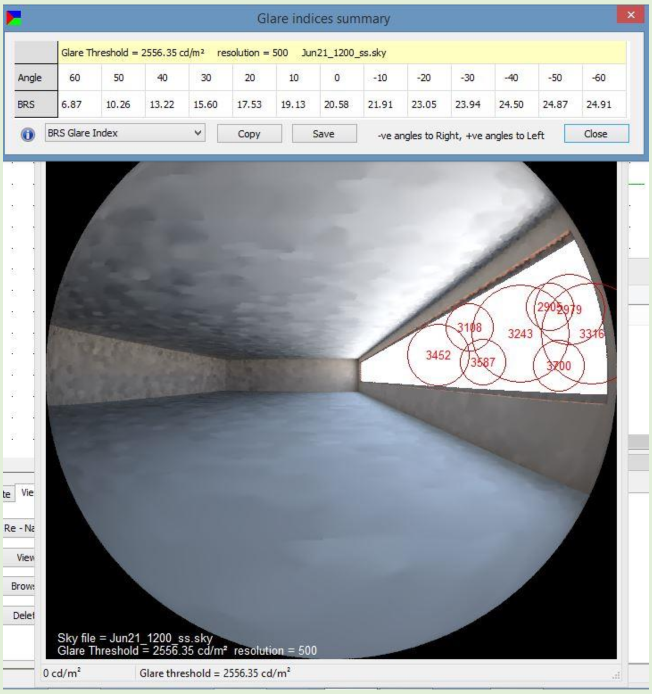
UGR



VCP


Glare indices summary
Glare Threshold = 2556.35 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 95.54 85.96 72.11 64.41 53.01 40.35 29.98 22.12 16.71 13.37 11.73 11.16 11.87
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2905
2979
3108
3243
3316
3452
3587
3700
Sky file = Jun21_1200_ss.sky
Glare Threshold = 2556.35 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2556.35 cd/m²

BRS


Glare indices summary
Glare Threshold = 2556.35 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 6.87 10.26 13.22 15.60 17.53 19.13 20.58 21.91 23.05 23.94 24.50 24.87 24.91
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2905
2979
3108
3243
3316
3452
3587
3700
Sky file = Jun21_1200_ss.sky
Glare Threshold = 2556.35 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2556.35 cd/m²

GDGR

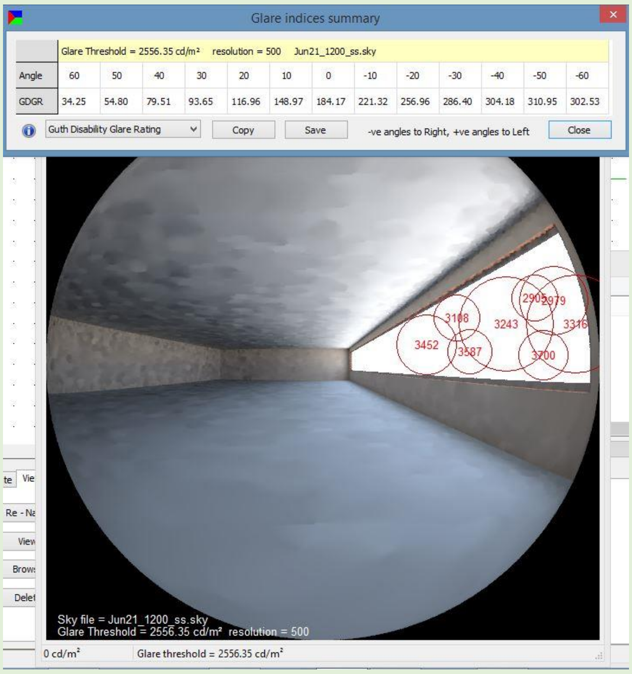
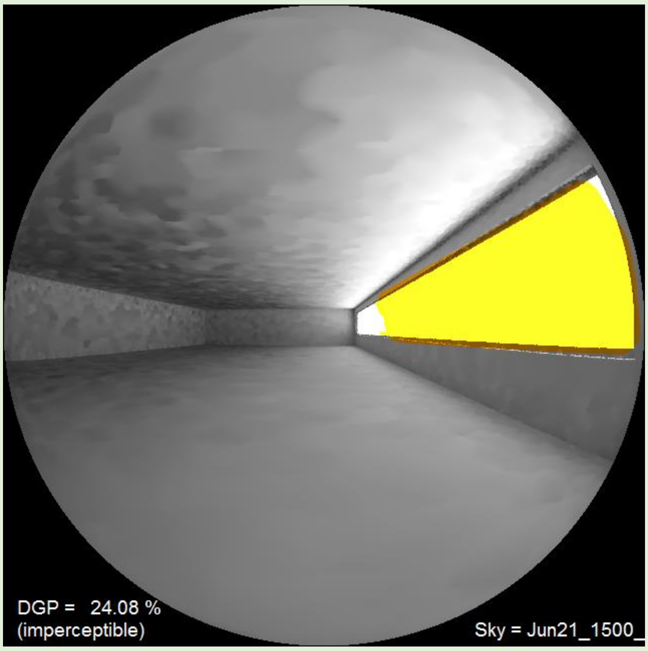

Glare indices summary
Glare Threshold = 2556.35 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 34.25 54.80 79.51 93.65 116.96 148.97 184.17 221.32 256.96 286.40 304.18 310.95 302.53
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2905
2979
3108
3243
3316
3452
3587
3700
Sky file = Jun21_1200_ss.sky
Glare Threshold = 2556.35 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2556.35 cd/m²

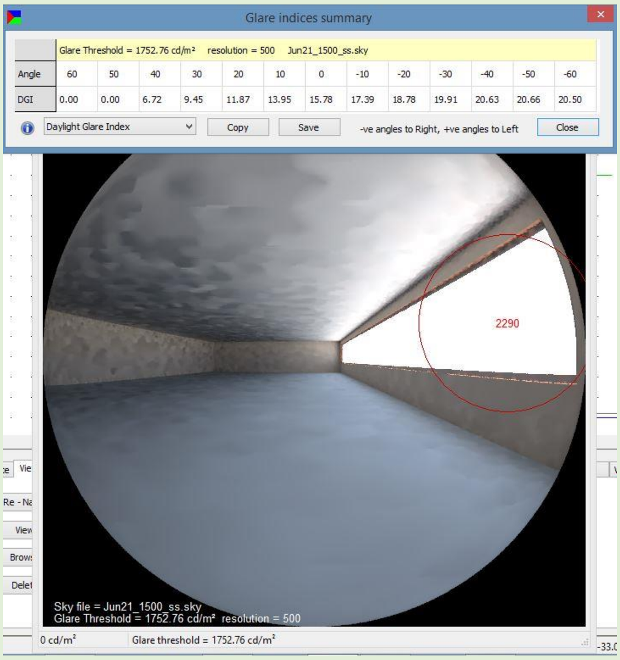
Table 219: Daylight and Glare Analysis for Jun 21, with sunny sky, (N), (P6/3m),(T15).

Daylight and Glare Analysis for Jun 21, (sunny sky), (N), (P6/3m) (T15).

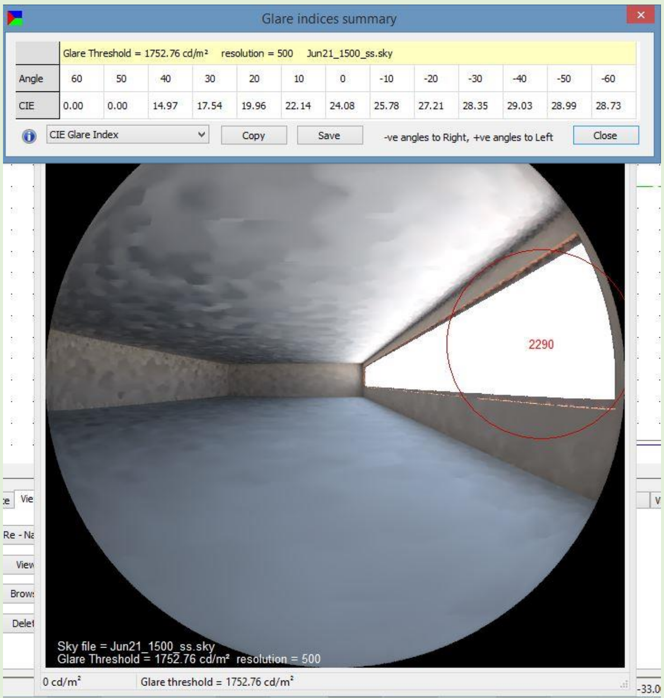
DGP



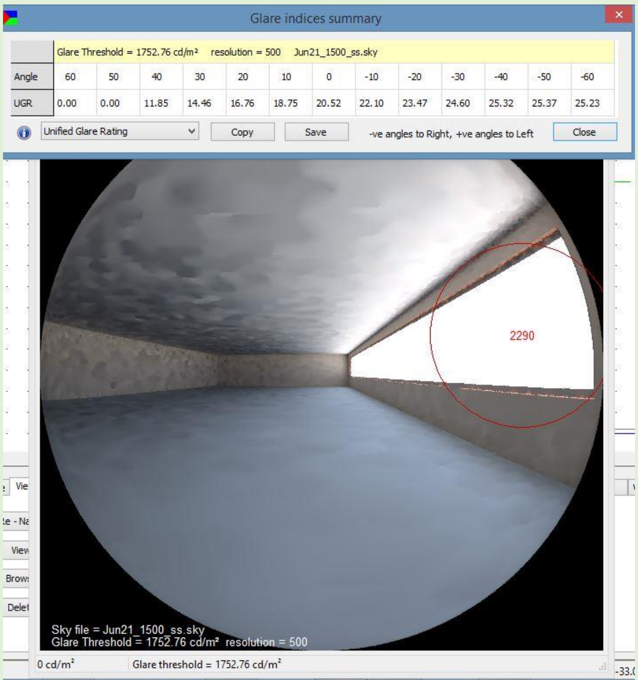
DGI



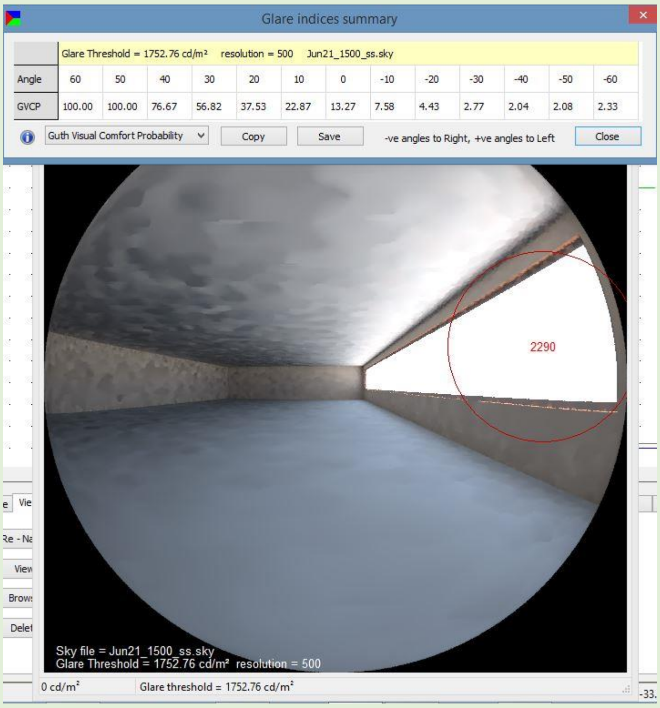
CGI



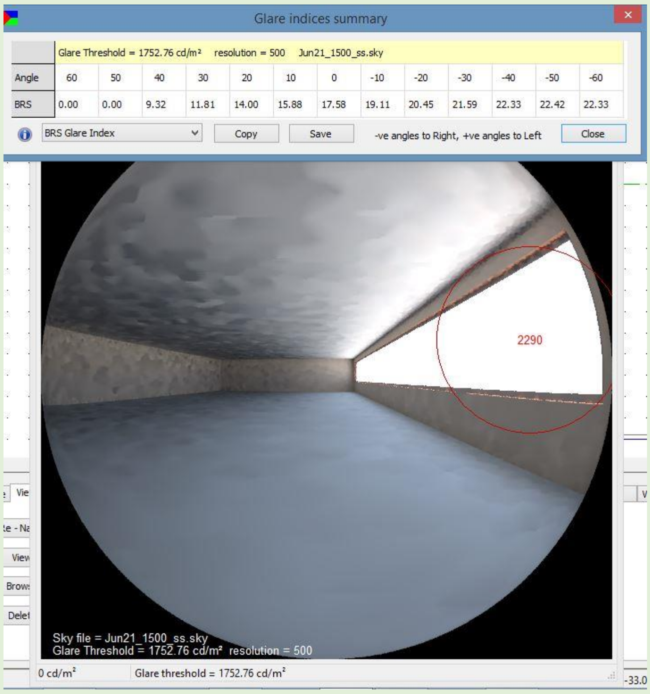
UGR



VCP


Glare indices summary
Glare Threshold = 1752.76 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 100.00 100.00 76.67 56.82 37.53 22.87 13.27 7.58 4.43 2.77 2.04 2.08 2.33
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2290
Sky file = Jun21_1500_ss.sky
Glare Threshold = 1752.76 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1752.76 cd/m²

BRS


Glare indices summary
Glare Threshold = 1752.76 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 0.00 0.00 9.32 11.81 14.00 15.88 17.58 19.11 20.45 21.59 22.33 22.42 22.33
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2290
Sky file = Jun21_1500_ss.sky
Glare Threshold = 1752.76 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1752.76 cd/m²

GDGR

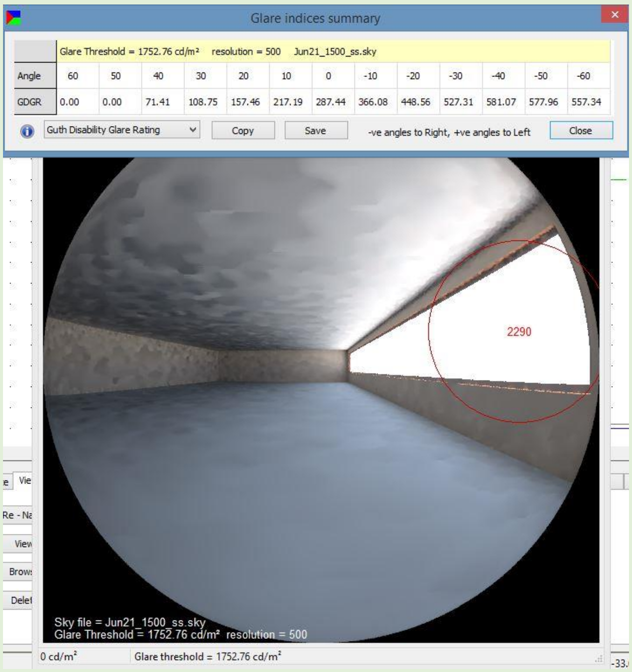

Glare indices summary
Glare Threshold = 1752.76 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 0.00 0.00 71.41 108.75 157.46 217.19 287.44 366.08 448.56 527.31 581.07 577.96 557.34
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2290
Sky file = Jun21_1500_ss.sky
Glare Threshold = 1752.76 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1752.76 cd/m²

Table 220: Daylight and Glare Analysis for Jun 21, with sunny sky, (S), (P4/1.5m),(T7).

Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P4/1.5m) (T7).

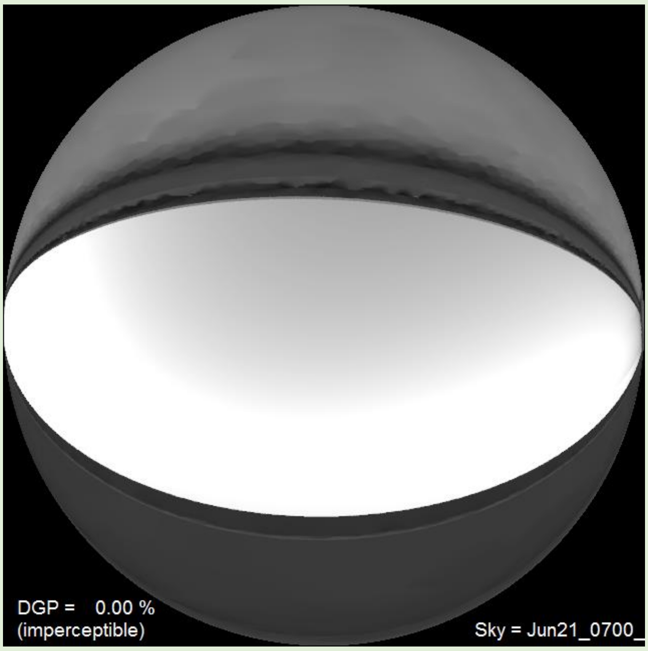
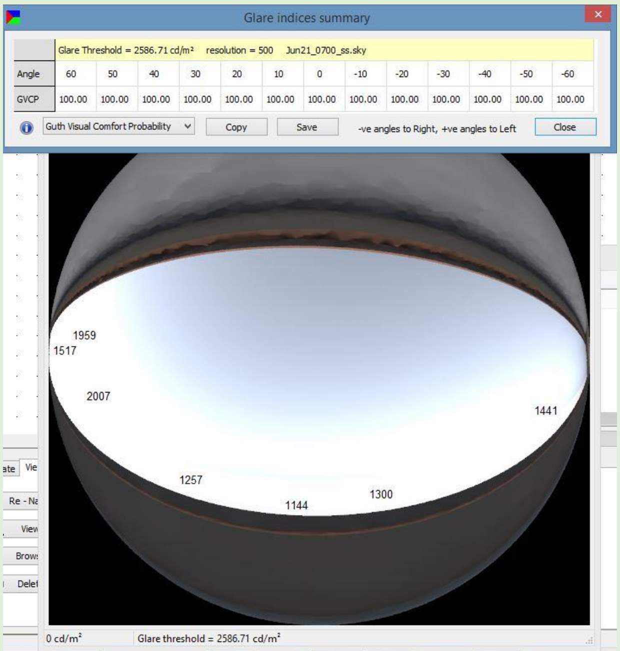
DGP	VCP
	

Table 221: Daylight and Glare Analysis for Jun 21, with sunny sky, (S), (P4/1.5m),(T9).

Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P4/1.5m) (T9).

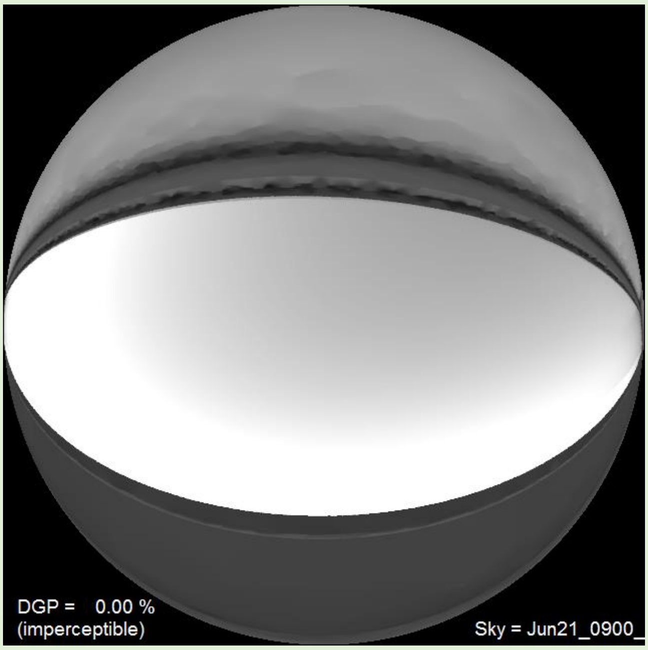
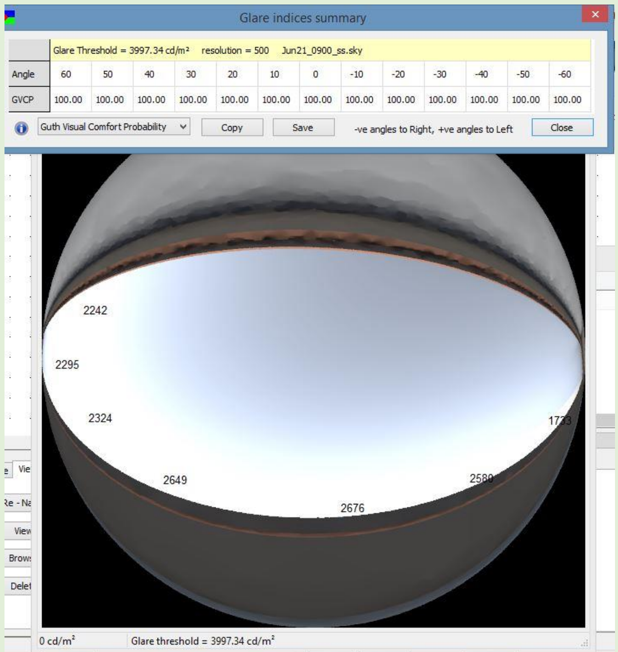
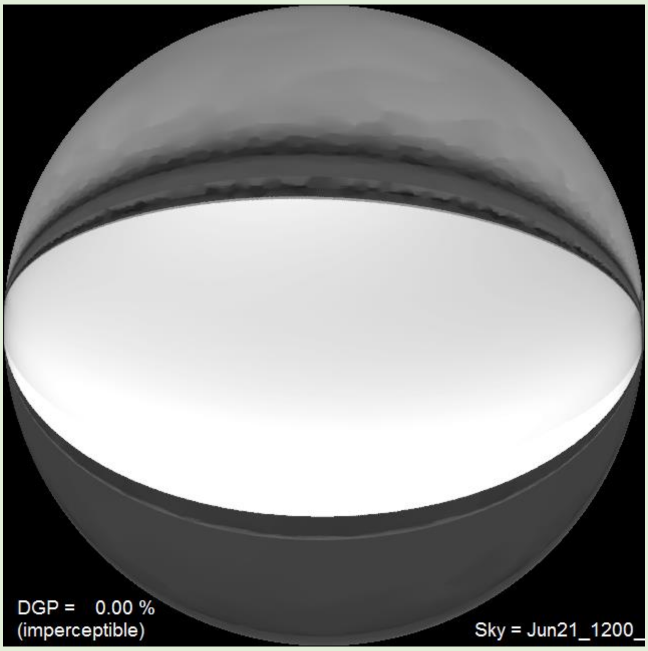
DGP	VCP
	

Table 222: Daylight and Glare Analysis for Jun 21, with sunny sky, (S), (P4/1.5m),(T12).

Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P4/1.5m) (T12).

DGP



VCP

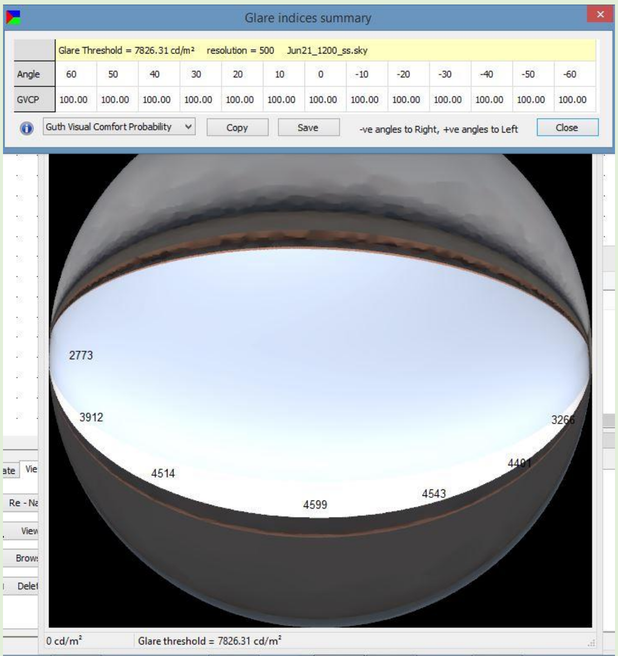
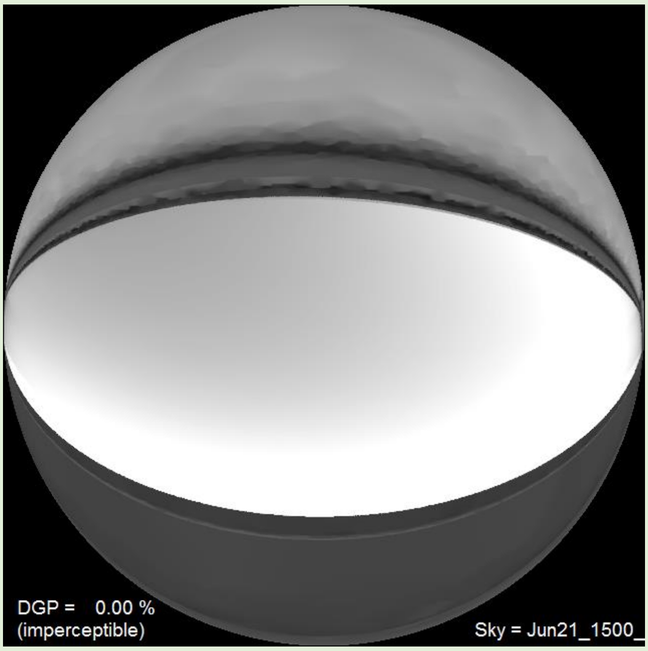


Table 223: Daylight and Glare Analysis for Jun 21, with sunny sky, (S), (P4/1.5m),(T15).

Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P4/1.5m) (T15).

DGP



VCP

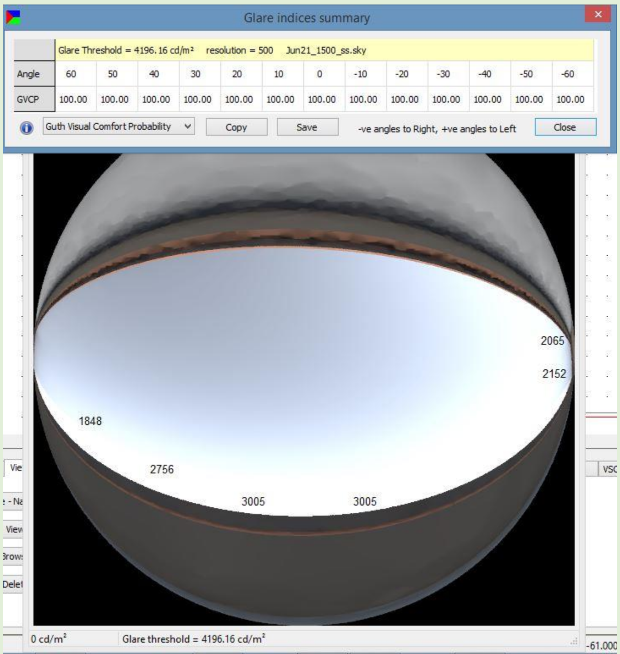
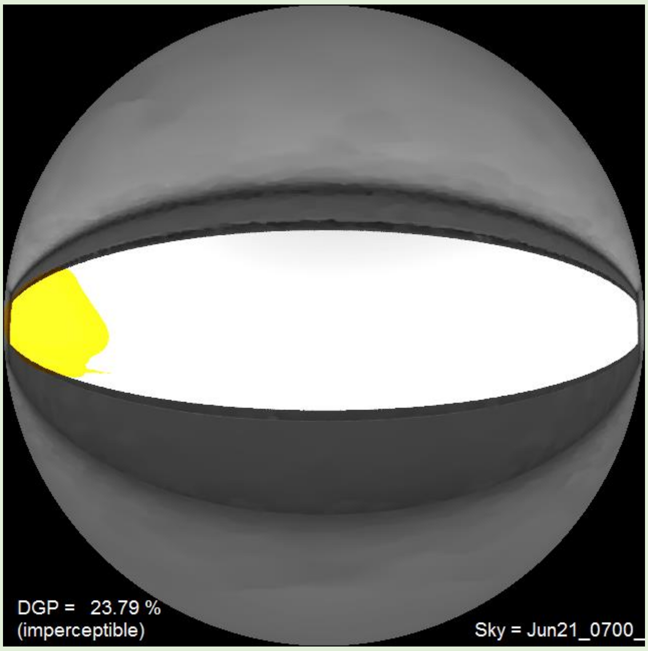


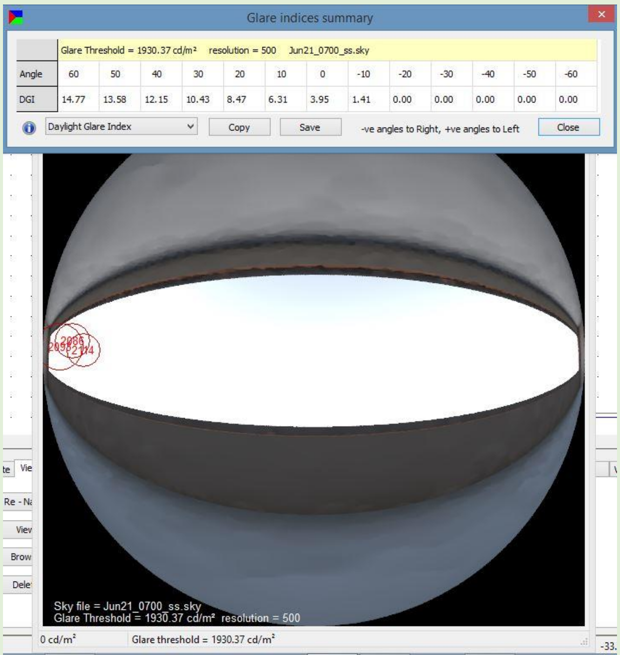
Table 224: Daylight and Glare Analysis for Jun 21, with sunny sky, (S), (P4/3m),(T7).

Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P4/3m) (T7).

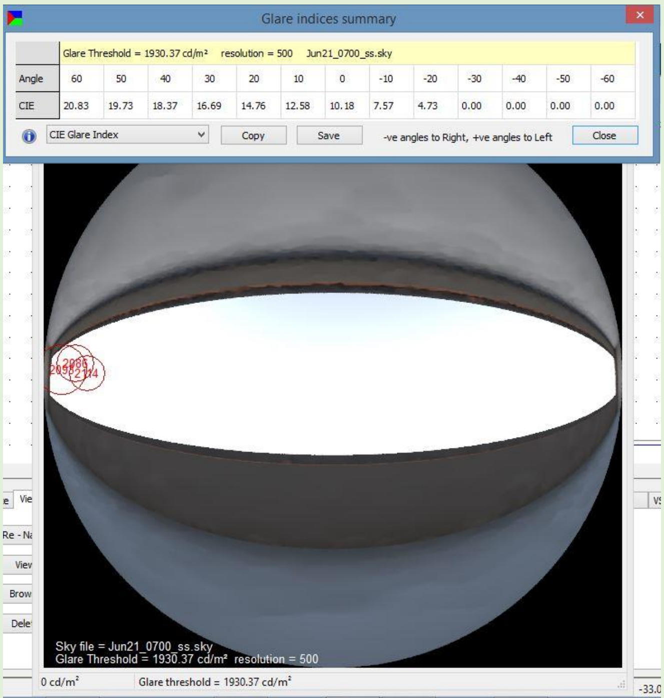
DGP



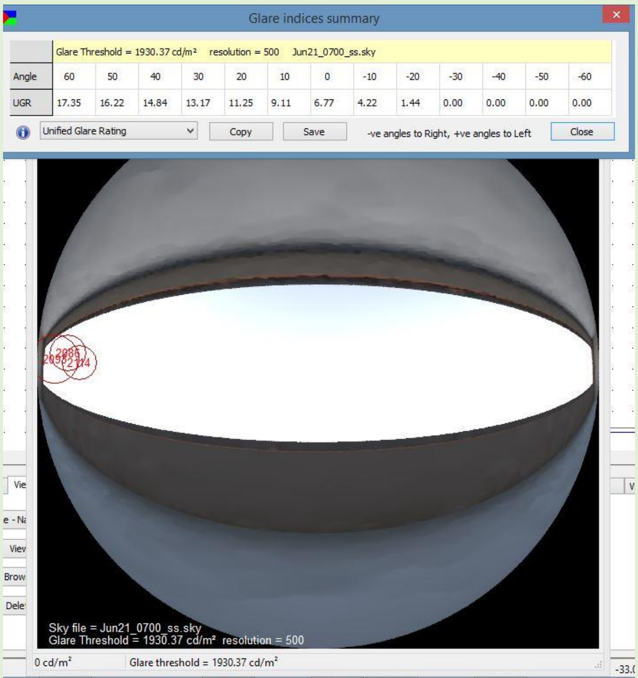
DGI



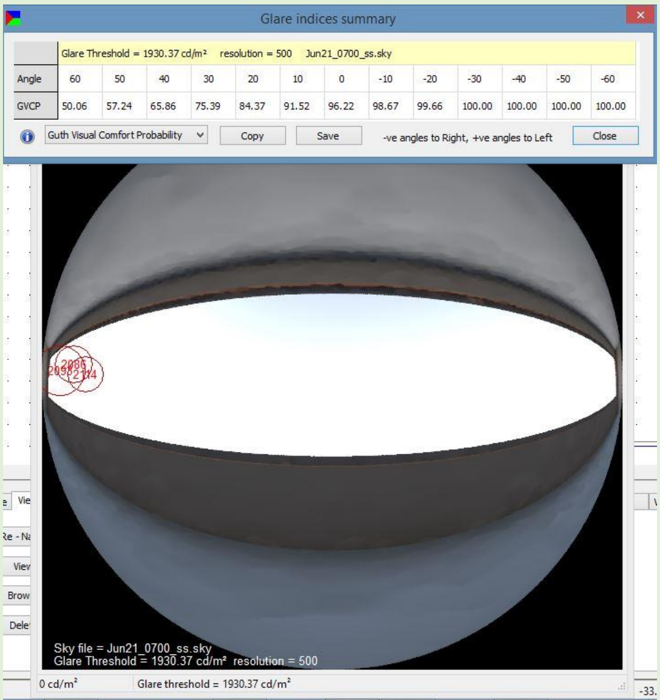
CGI



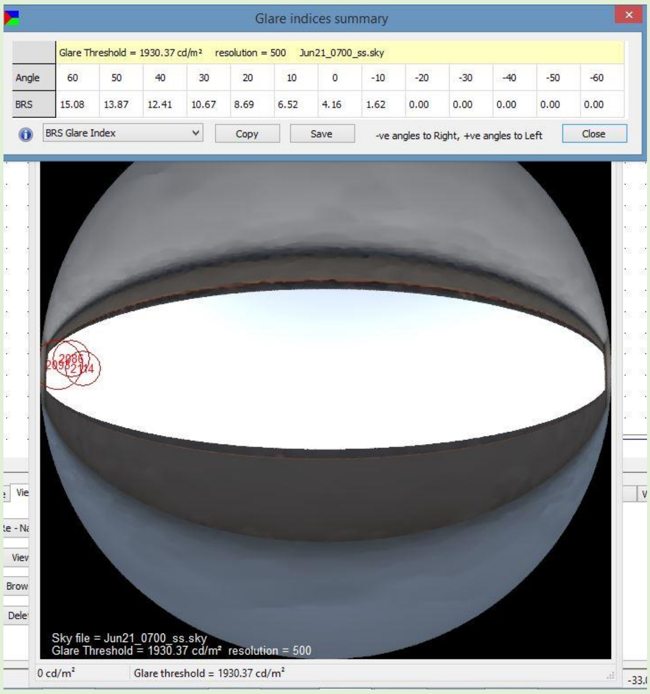
UGR



VCP


Glare indices summary
Glare Threshold = 1930.37 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 50.06 57.24 65.86 75.39 84.37 91.52 96.22 98.67 99.66 100.00 100.00 100.00 100.00
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_0700_ss.sky
Glare Threshold = 1930.37 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1930.37 cd/m²

BRS


Glare indices summary
Glare Threshold = 1930.37 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 15.08 13.87 12.41 10.67 8.69 6.52 4.16 1.62 0.00 0.00 0.00 0.00 0.00
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_0700_ss.sky
Glare Threshold = 1930.37 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1930.37 cd/m²

GDGR

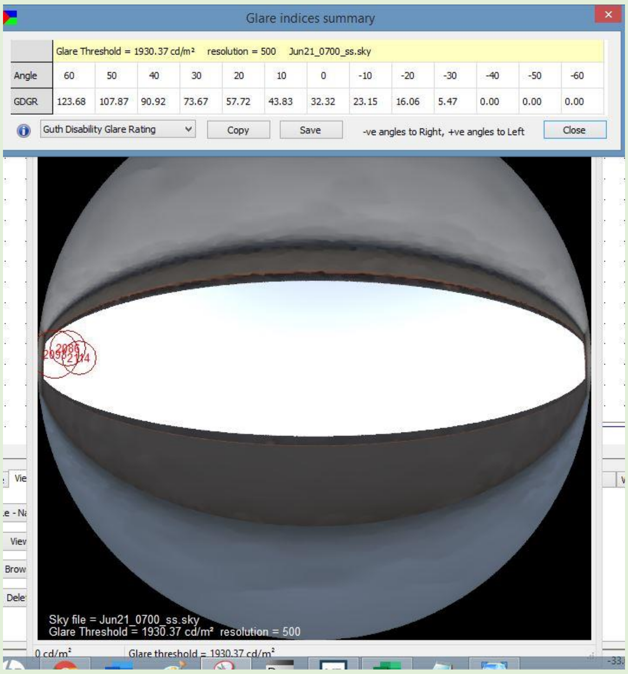
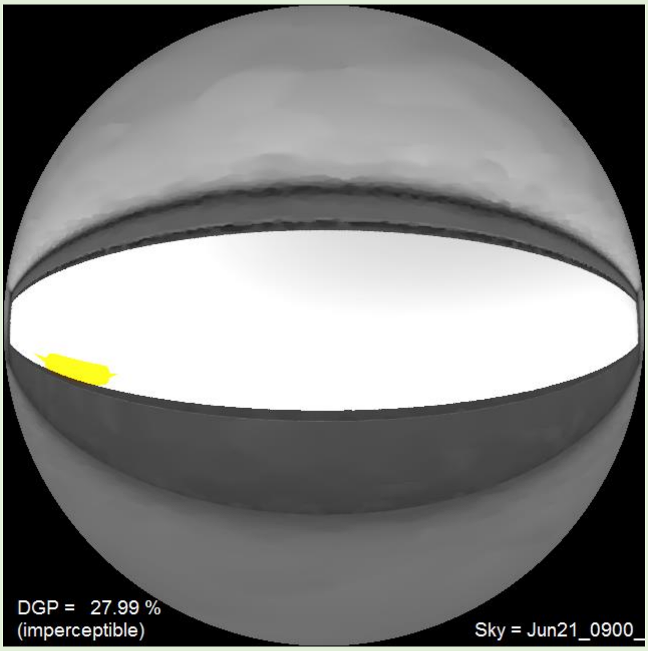

Glare indices summary
Glare Threshold = 1930.37 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 123.68 107.87 90.92 73.67 57.72 43.83 32.32 23.15 16.06 5.47 0.00 0.00 0.00
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_0700_ss.sky
Glare Threshold = 1930.37 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1930.37 cd/m²

Table 225: Daylight and Glare Analysis for Jun 21, with sunny sky, (S), (P4/3m),(T9).

Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P4/3m) (T9).

DGP



VCP

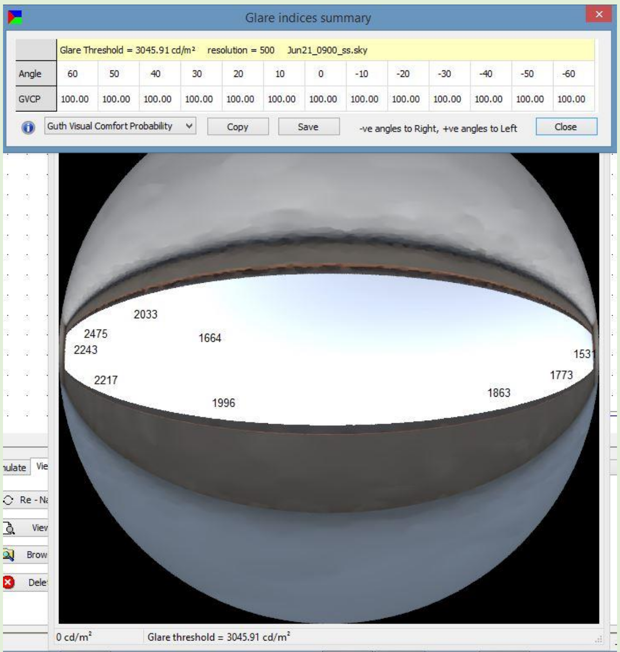
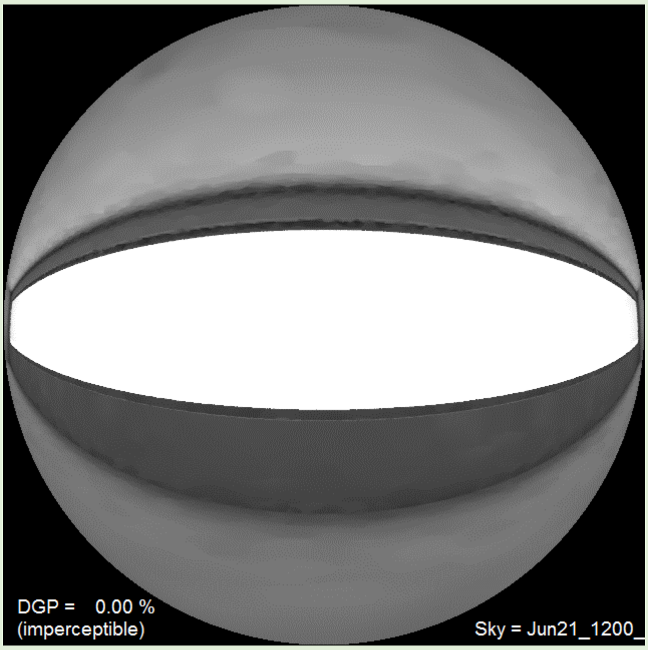


Table 226: Daylight and Glare Analysis for Jun 21, with sunny sky, (S), (P4/3m),(T12).

Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P4/3m) (T12).

DGP



VCP

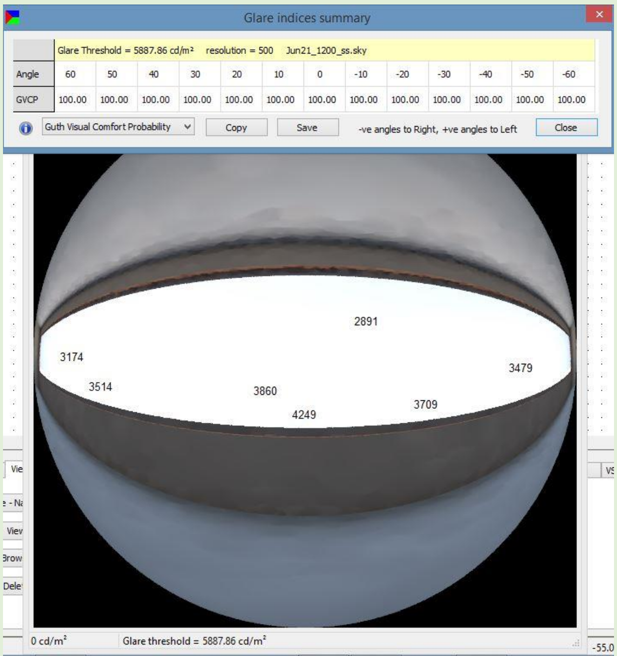


Table 227: Daylight and Glare Analysis for Jun 21, with sunny sky, (S), (P4/3m),(T15).

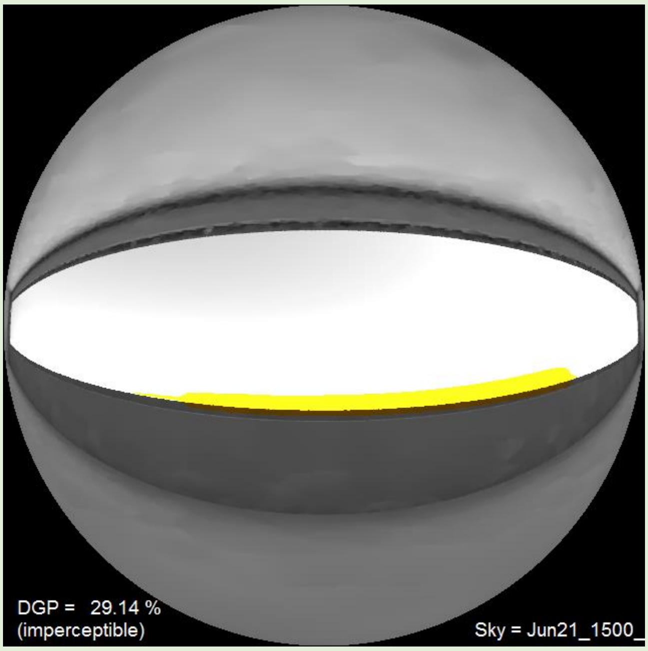
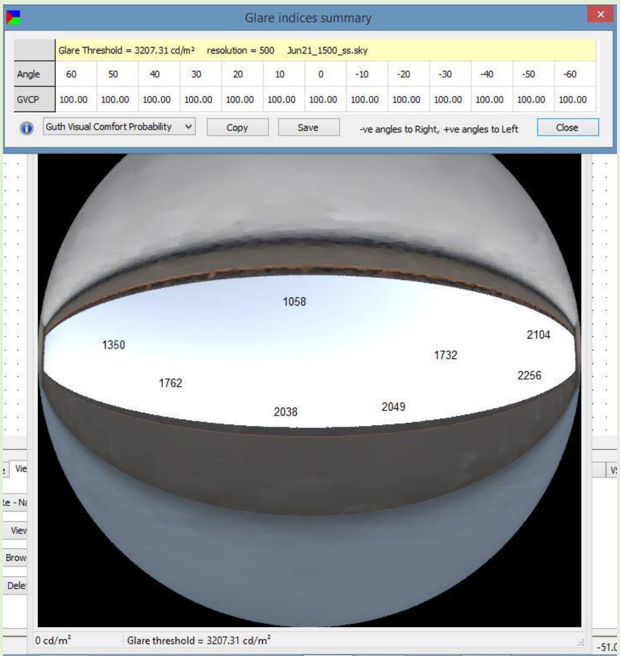
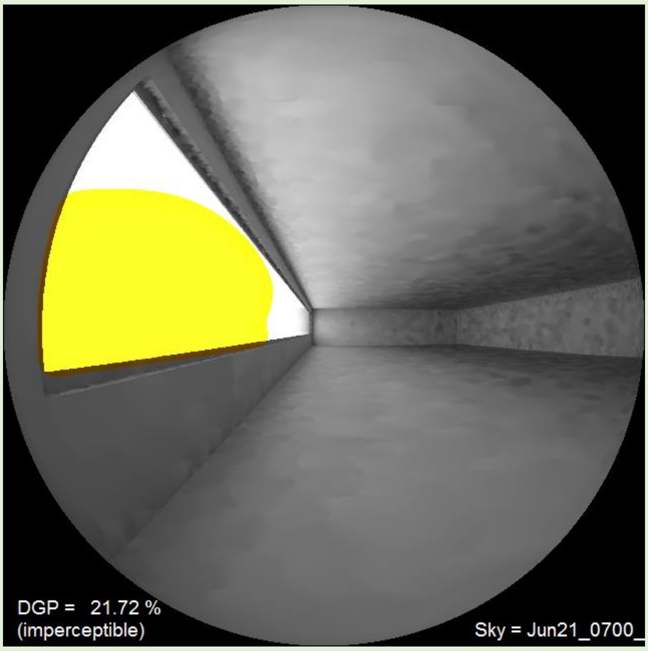
Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P4/3m) (T15).	
DGP	**VCP**
	

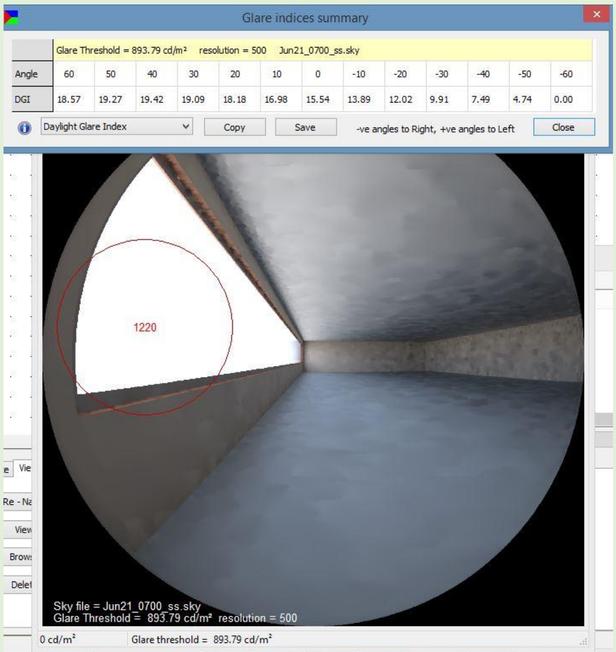
Table 228: Daylight and Glare Analysis for Jun 21, with sunny sky, (S), (P5/1.5m),(T7).

Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P5/1.5m) (T7).

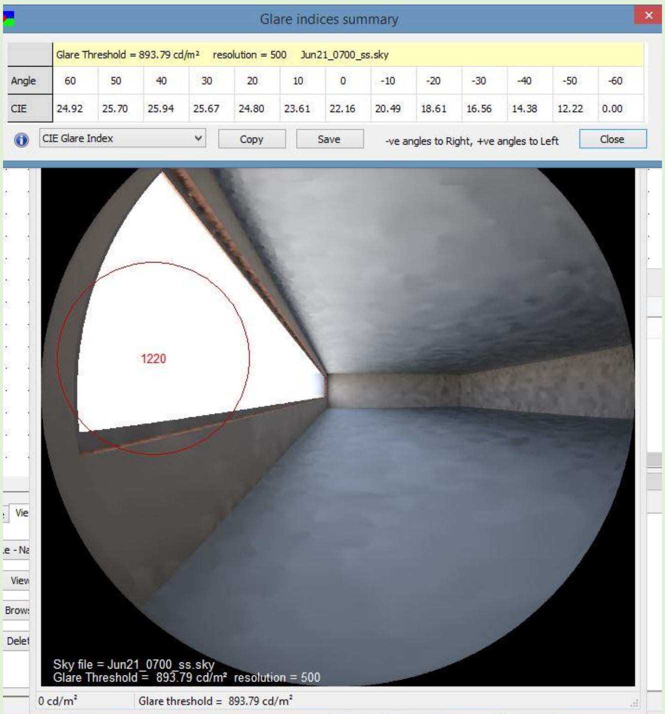
DGP



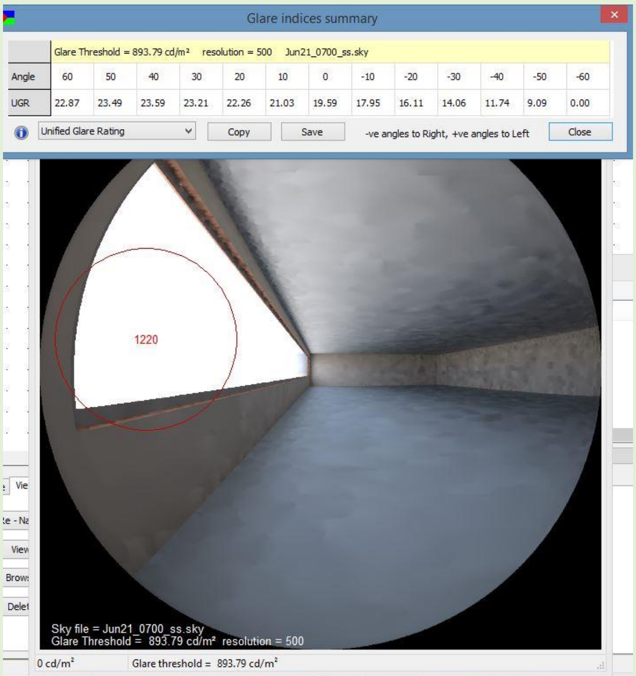
DGI



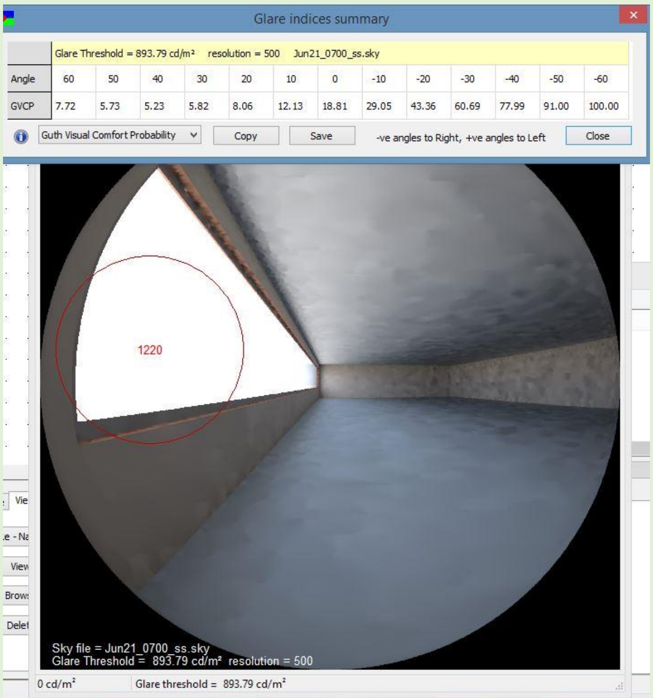
CGI



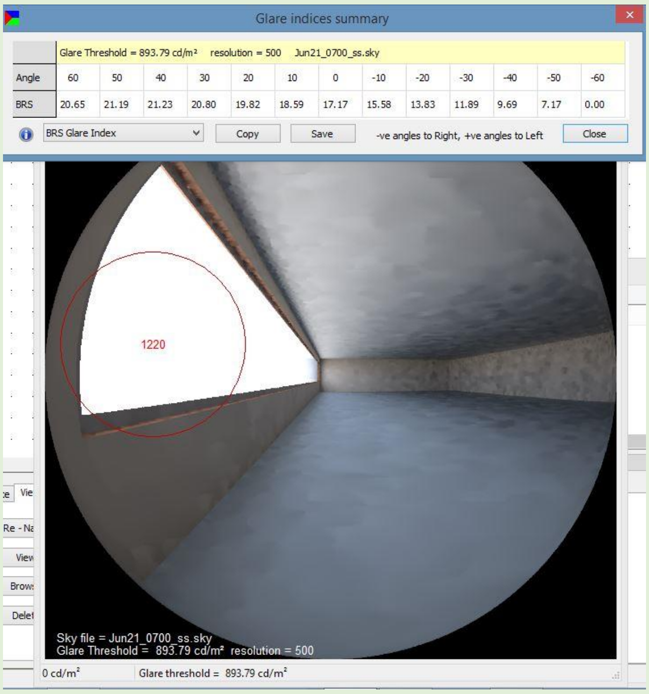
UGR



VCP


Glare indices summary
Glare Threshold = 893.79 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 7.72 5.73 5.23 5.82 8.06 12.13 18.81 29.05 43.36 60.69 77.99 91.00 100.00
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1220
Sky file = Jun21_0700_ss.sky
Glare Threshold = 893.79 cd/m² resolution = 500
0 cd/m²
Glare threshold = 893.79 cd/m²

BRS


Glare indices summary
Glare Threshold = 893.79 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 20.65 21.19 21.23 20.80 19.82 18.59 17.17 15.58 13.83 11.89 9.69 7.17 0.00
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1220
Sky file = Jun21_0700_ss.sky
Glare Threshold = 893.79 cd/m² resolution = 500
0 cd/m²
Glare threshold = 893.79 cd/m²

GDGR

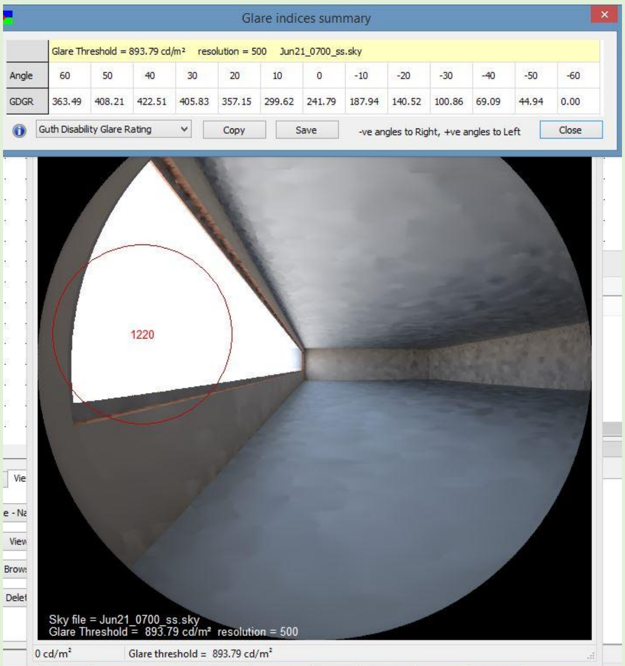
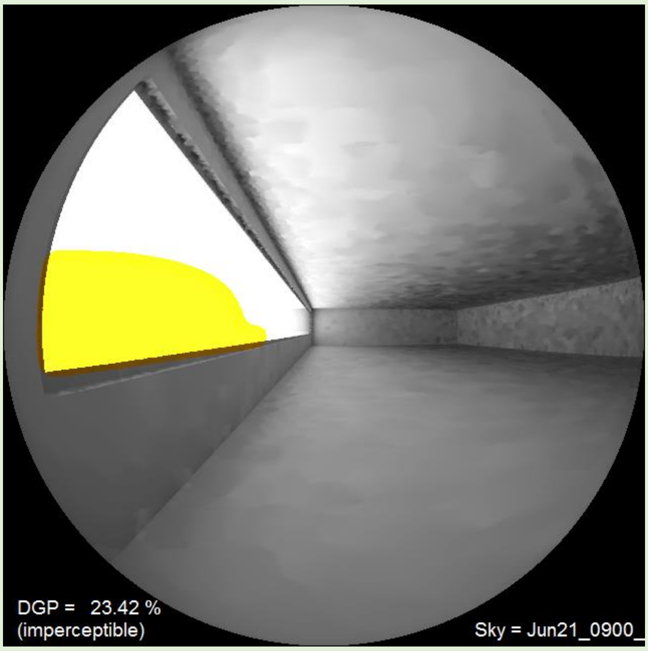

Glare indices summary
Glare Threshold = 893.79 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 363.49 408.21 422.51 405.83 357.15 299.62 241.79 187.94 140.52 100.86 69.09 44.94 0.00
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1220
Sky file = Jun21_0700_ss.sky
Glare Threshold = 893.79 cd/m² resolution = 500
0 cd/m²
Glare threshold = 893.79 cd/m²

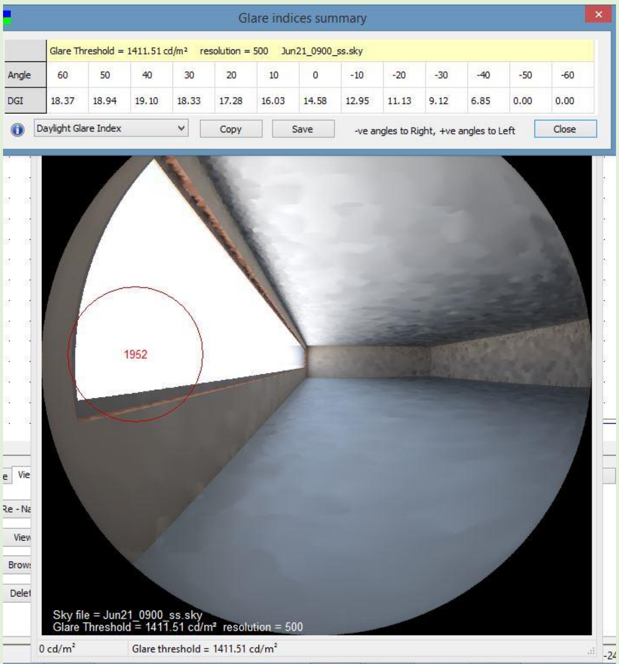
Table 229: Daylight and Glare Analysis for Jun 21, with sunny sky, (S), (P5/1.5m),(T9).

Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P5/1.5m) (T9).

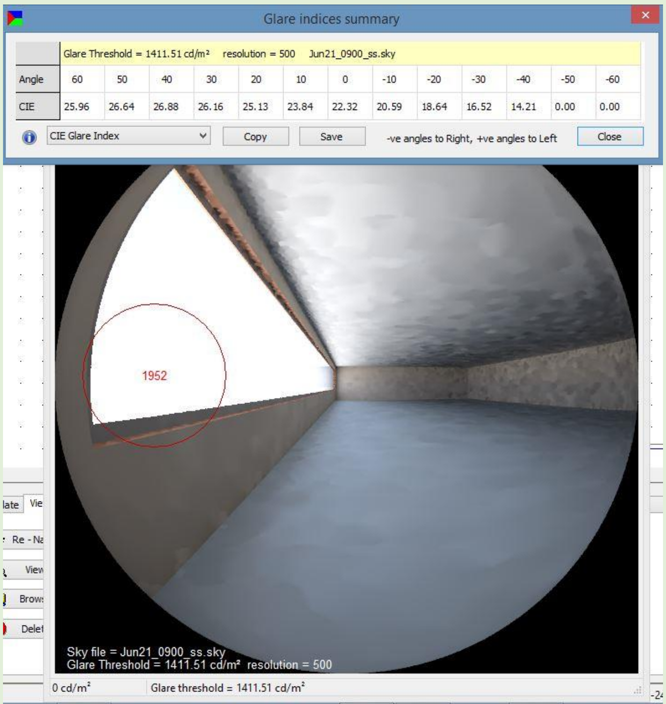
DGP



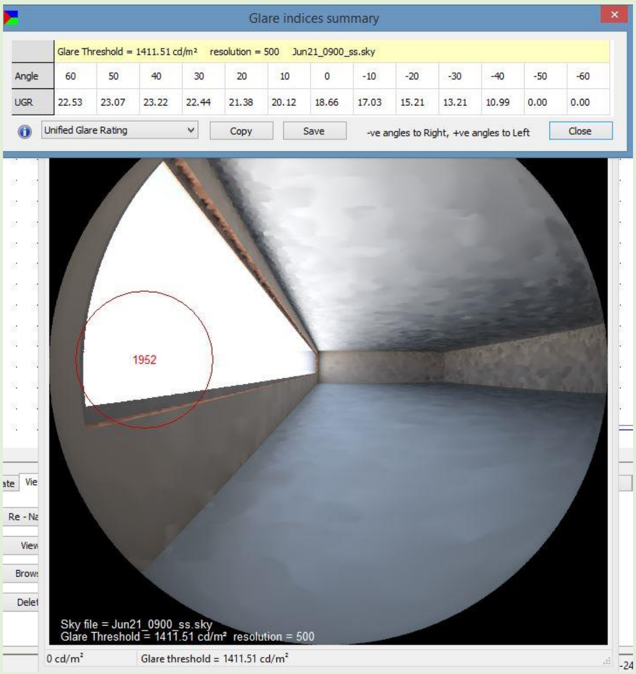
DGI



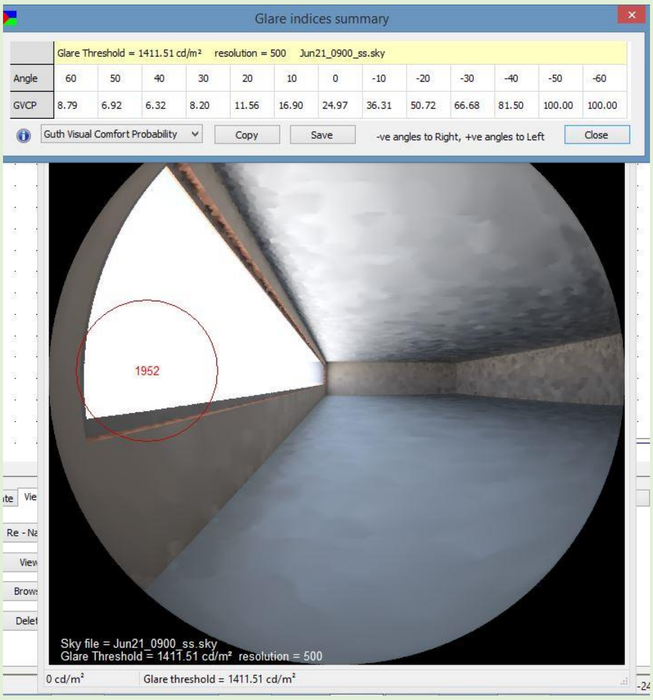
CGI



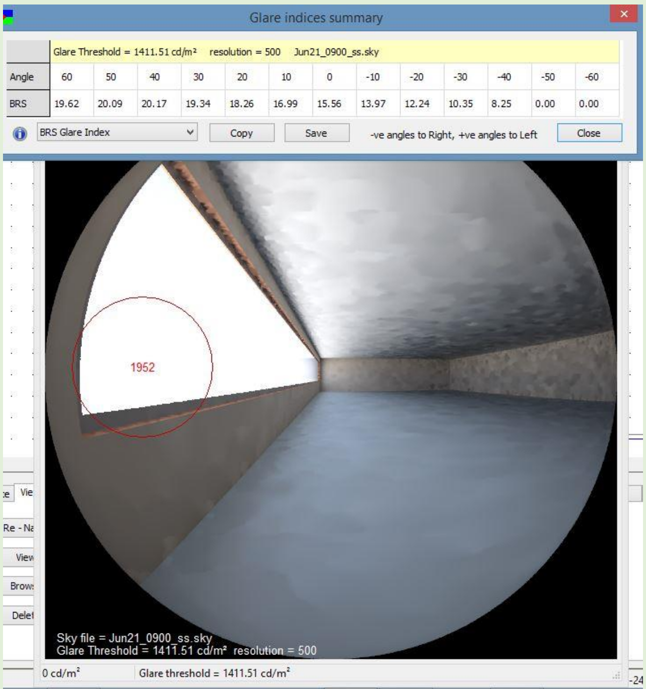
UGR



VCP


Glare indices summary
Glare Threshold = 1411.51 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 8.79 6.92 6.32 8.20 11.56 16.90 24.97 36.31 50.72 66.68 81.50 100.00 100.00
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1952
Sky file = Jun21_0900_ss.sky
Glare Threshold = 1411.51 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1411.51 cd/m²

BRS


Glare indices summary
Glare Threshold = 1411.51 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 19.62 20.09 20.17 19.34 18.26 16.99 15.56 13.97 12.24 10.35 8.25 0.00 0.00
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1952
Sky file = Jun21_0900_ss.sky
Glare Threshold = 1411.51 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1411.51 cd/m²

GDGR

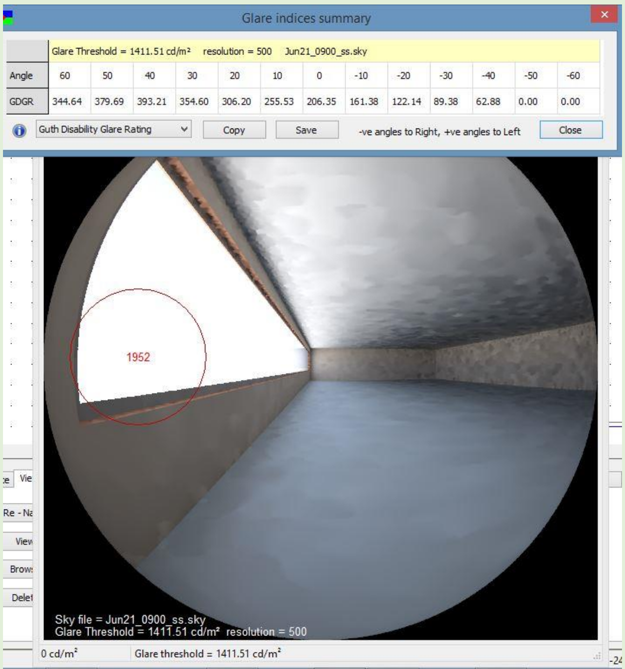
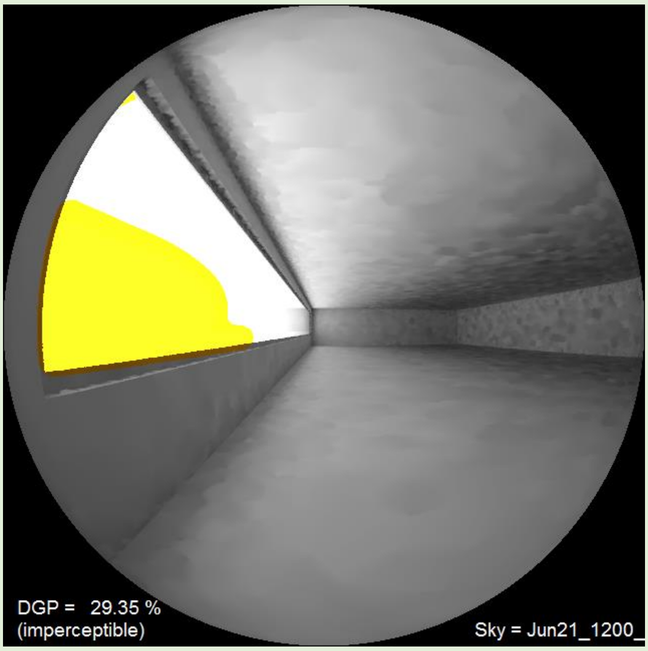

Glare indices summary
Glare Threshold = 1411.51 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 344.64 379.69 393.21 354.60 306.20 255.53 206.35 161.38 122.14 89.38 62.88 0.00 0.00
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1952
Sky file = Jun21_0900_ss.sky
Glare Threshold = 1411.51 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1411.51 cd/m²

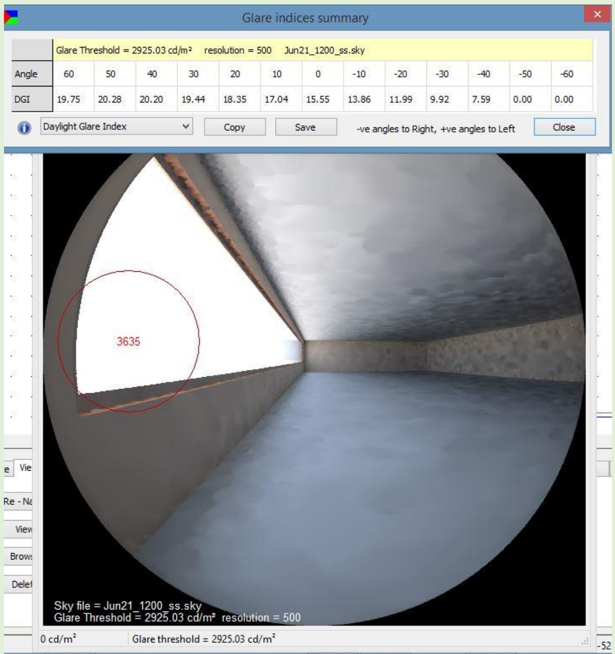
Table 230: Daylight and Glare Analysis for Jun 21, with sunny sky, (S), (P5/1.5m),(T12).

Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P5/1.5m) (T12).

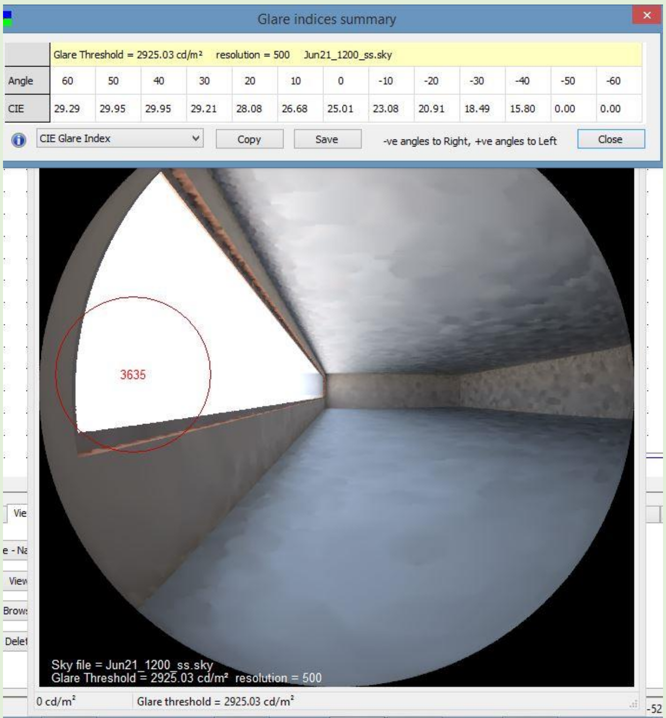
DGP



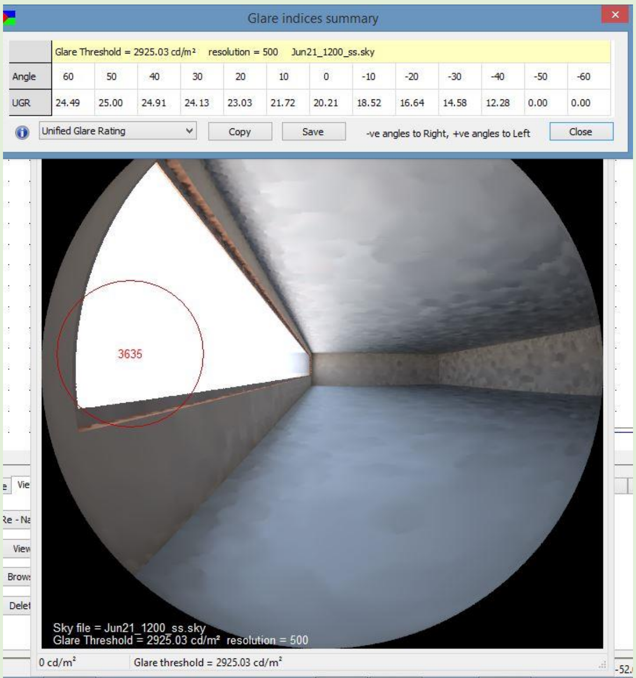
DGI



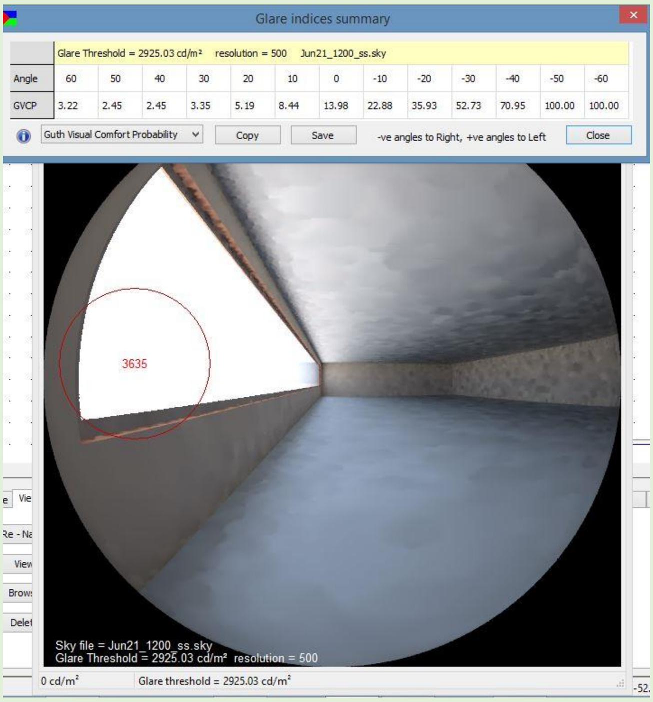
CGI



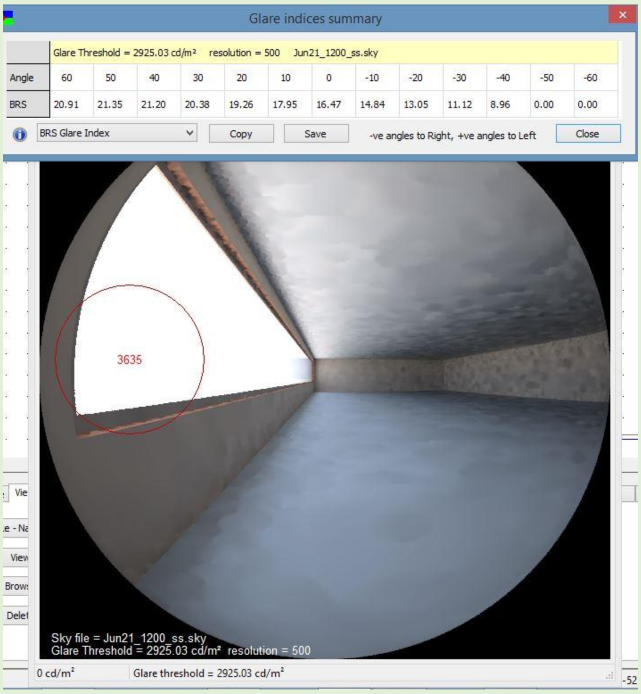
UGR



VCP


Glare indices summary
Glare Threshold = 2925.03 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 3.22 2.45 2.45 3.35 5.19 8.44 13.98 22.88 35.93 52.73 70.95 100.00 100.00
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3635
Sky file = Jun21_1200_ss.sky
Glare Threshold = 2925.03 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2925.03 cd/m²

BRS


Glare indices summary
Glare Threshold = 2925.03 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 20.91 21.35 21.20 20.38 19.26 17.95 16.47 14.84 13.05 11.12 8.96 0.00 0.00
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3635
Sky file = Jun21_1200_ss.sky
Glare Threshold = 2925.03 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2925.03 cd/m²

GDGR

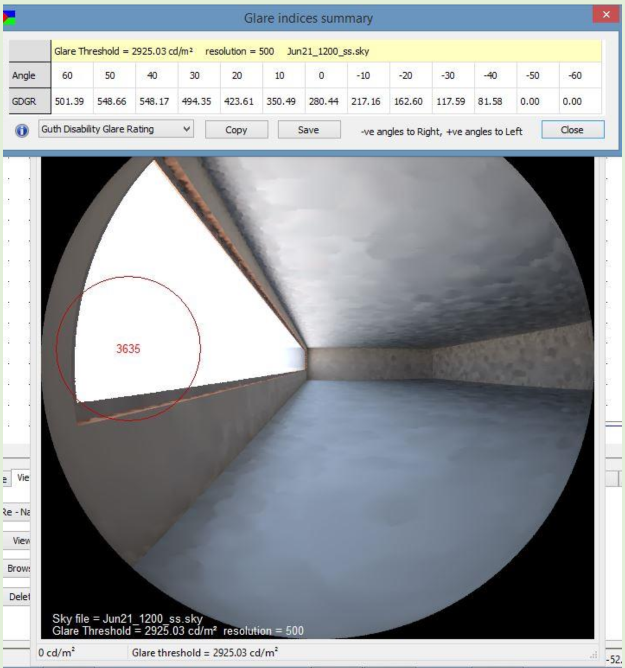
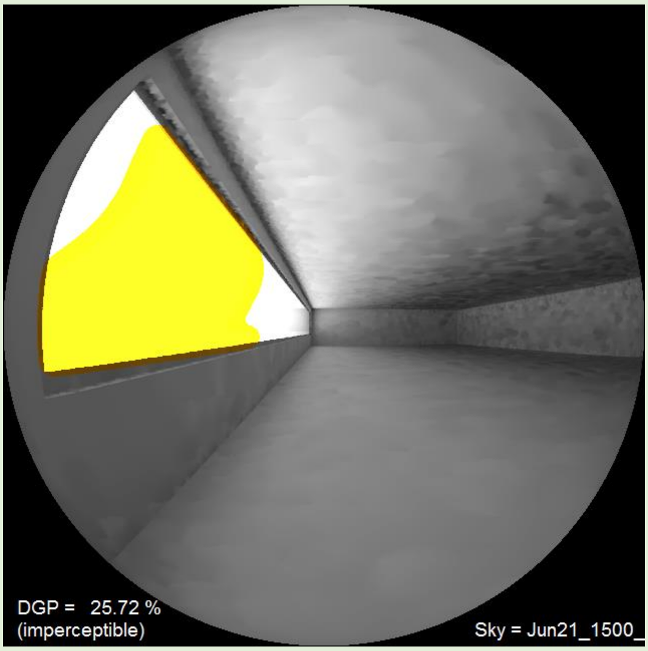

Glare indices summary
Glare Threshold = 2925.03 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 501.39 548.66 548.17 494.35 423.61 350.49 280.44 217.16 162.60 117.59 81.58 0.00 0.00
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3635
Sky file = Jun21_1200_ss.sky
Glare Threshold = 2925.03 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2925.03 cd/m²

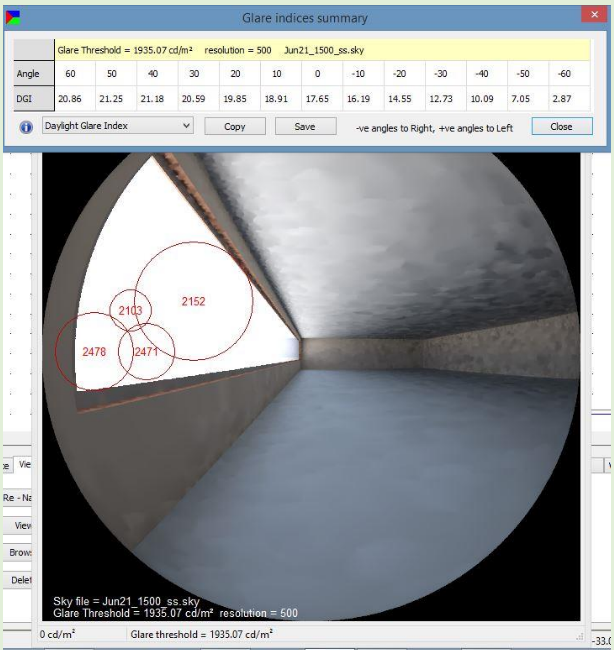
Table 231: Daylight and Glare Analysis for Jun 21, with sunny sky, (S), (P5/1.5m),(T15).

Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P5/1.5m) (T15).

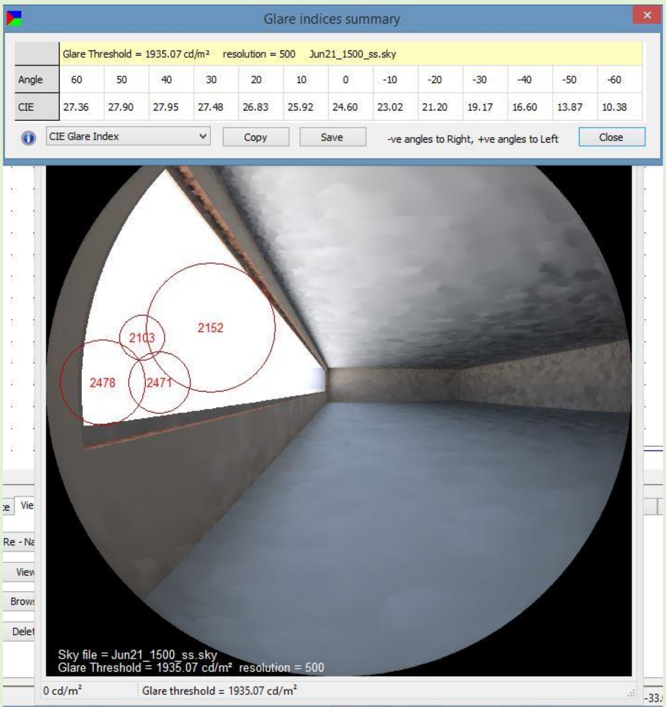
DGP



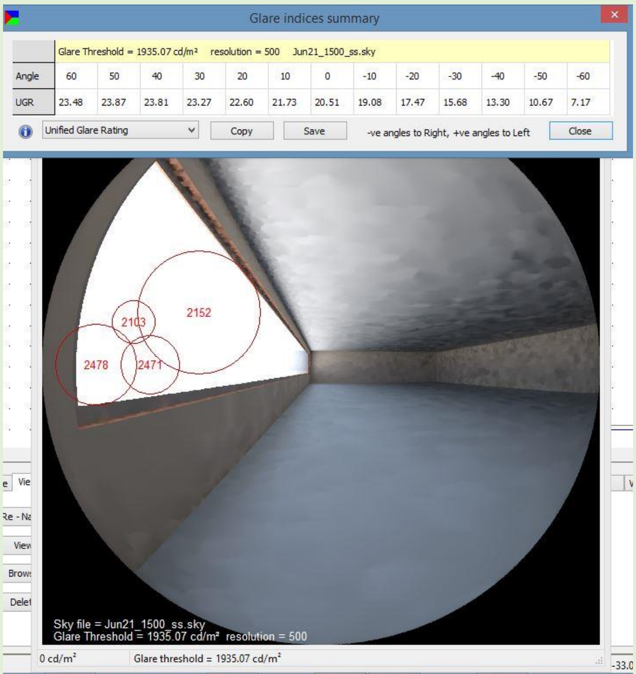
DGI

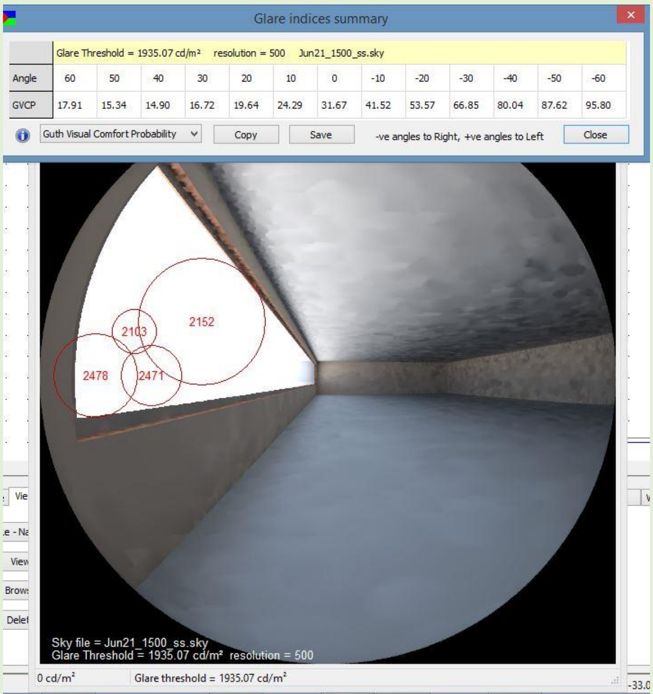
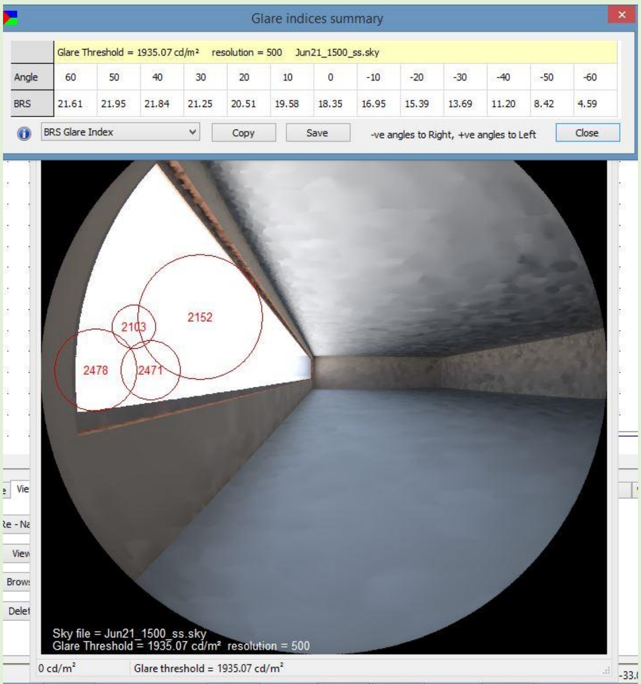


CGI



UGR

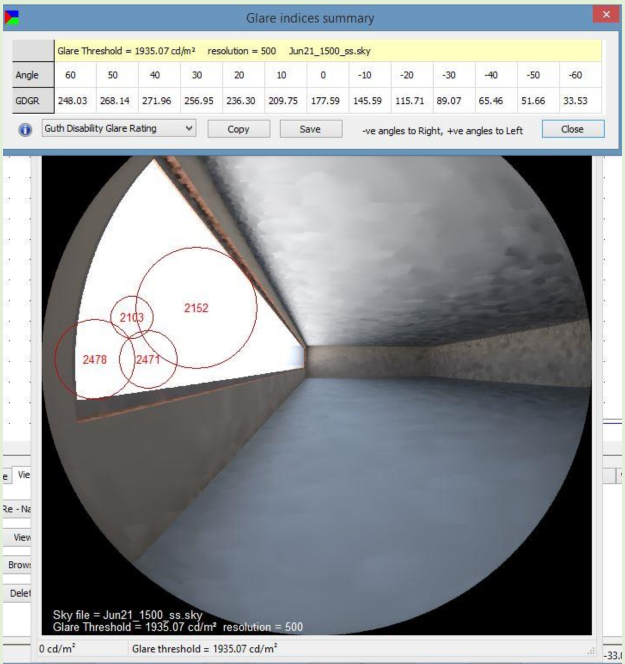


VCP	BRS
	

Glare indices summary
Glare Threshold = 1935.07 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 17.91 15.34 14.90 16.72 19.64 24.29 31.67 41.52 53.57 66.85 80.04 87.62 95.80
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2103
2152
2478
2471
Sky file = Jun21_1500_ss.sky
Glare Threshold = 1935.07 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1935.07 cd/m²

Glare indices summary
Glare Threshold = 1935.07 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 21.61 21.95 21.84 21.25 20.51 19.58 18.35 16.95 15.39 13.69 11.20 8.42 4.59
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2103
2152
2478
2471
Sky file = Jun21_1500_ss.sky
Glare Threshold = 1935.07 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1935.07 cd/m²

GDGR

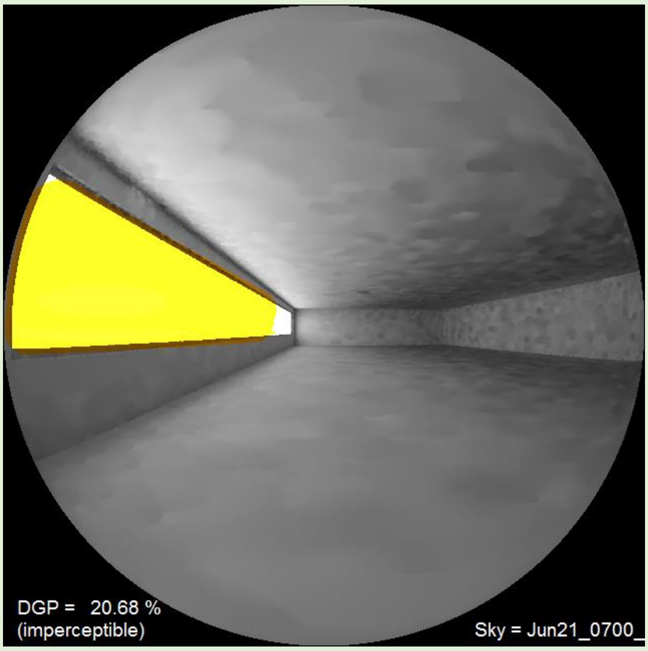


Glare indices summary
Glare Threshold = 1935.07 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 248.03 268.14 271.96 256.95 236.30 209.75 177.59 145.59 115.71 89.07 65.46 51.66 33.53
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2103
2152
2478
2471
Sky file = Jun21_1500_ss.sky
Glare Threshold = 1935.07 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1935.07 cd/m²

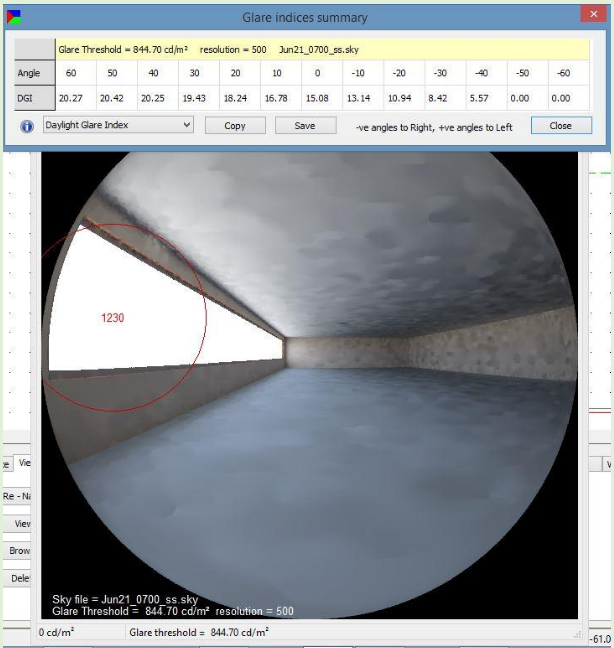
Table 232: Daylight and Glare Analysis for Jun 21, with sunny sky, (S), (P5/3m),(T7).

Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P5/3m) (T7).

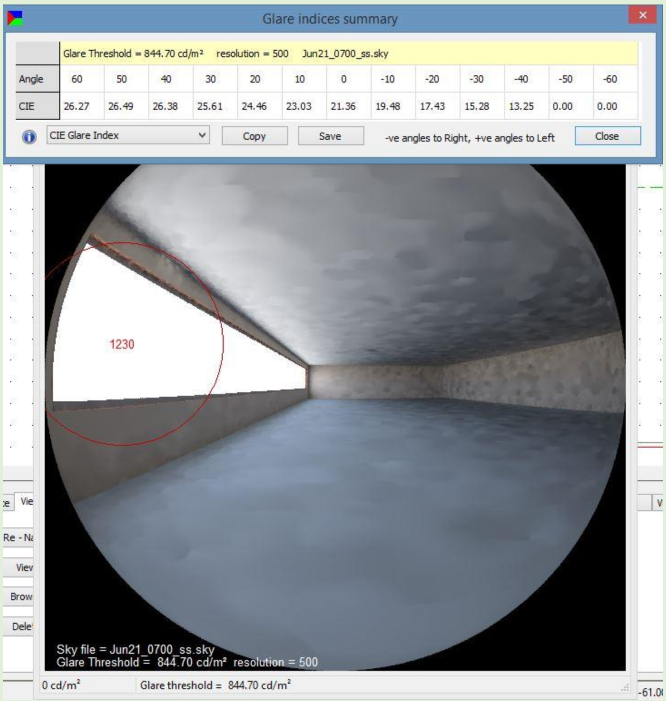
DGP



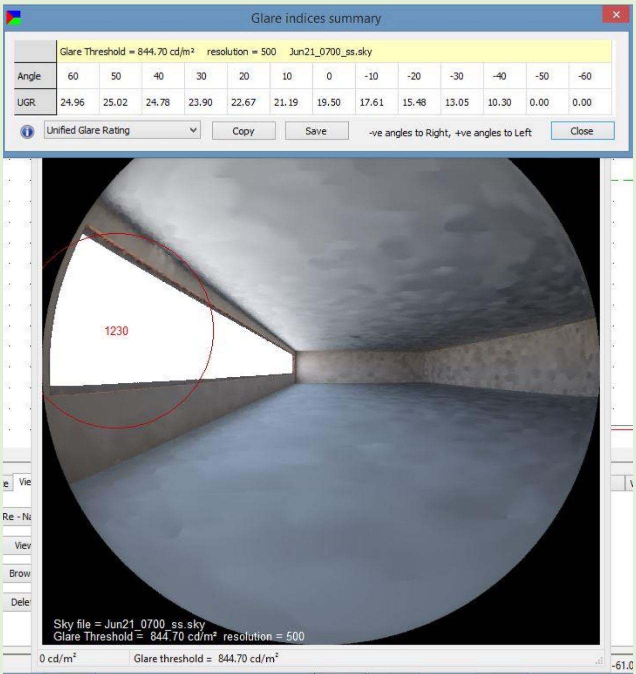
DGI



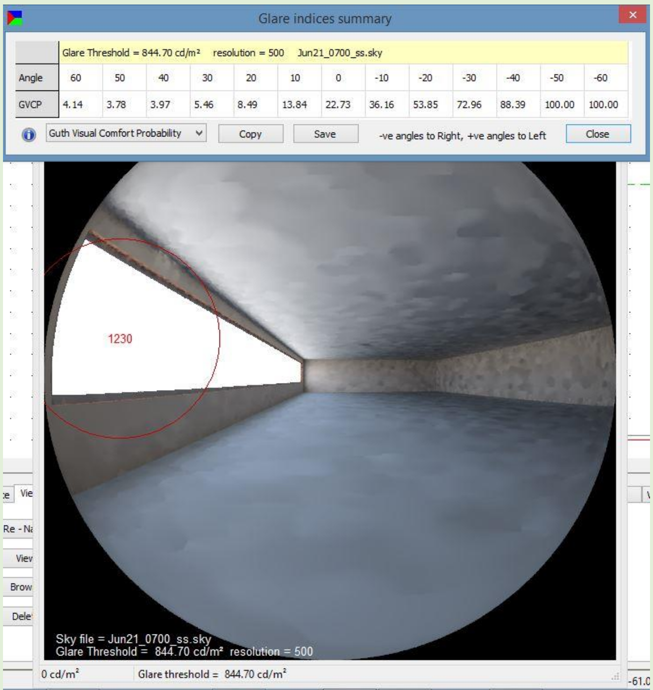
CGI



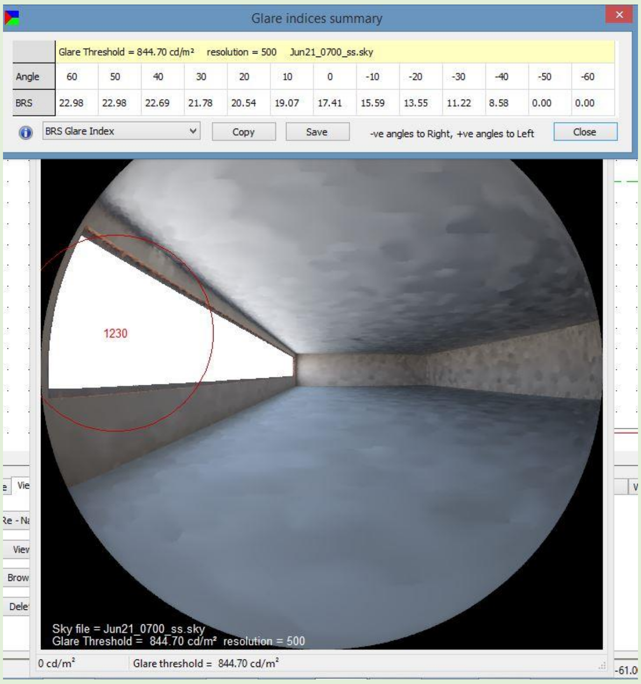
UGR



VCP


Glare indices summary
Glare Threshold = 844.70 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 4.14 3.78 3.97 5.46 8.49 13.84 22.73 36.16 53.85 72.96 88.39 100.00 100.00
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1230
Sky file = Jun21_0700_ss.sky
Glare Threshold = 844.70 cd/m² resolution = 500
0 cd/m²
Glare threshold = 844.70 cd/m²

BRS


Glare indices summary
Glare Threshold = 844.70 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 22.98 22.98 22.69 21.78 20.54 19.07 17.41 15.59 13.55 11.22 8.58 0.00 0.00
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1230
Sky file = Jun21_0700_ss.sky
Glare Threshold = 844.70 cd/m² resolution = 500
0 cd/m²
Glare threshold = 844.70 cd/m²

GDGR

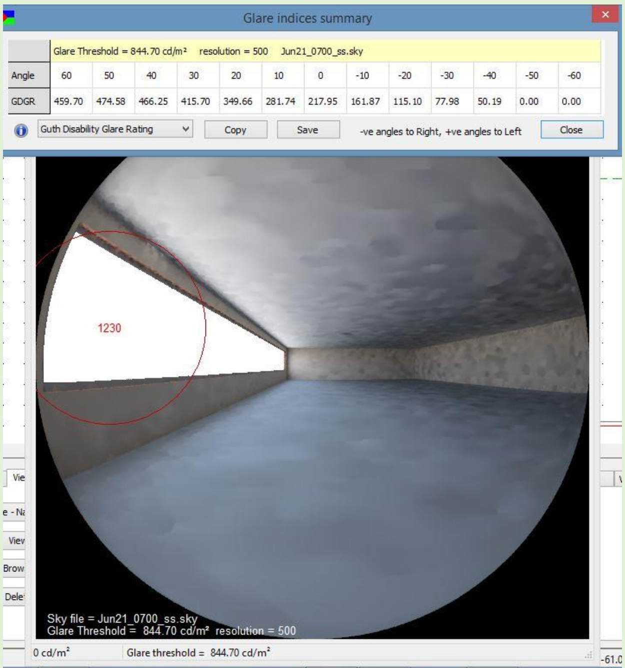
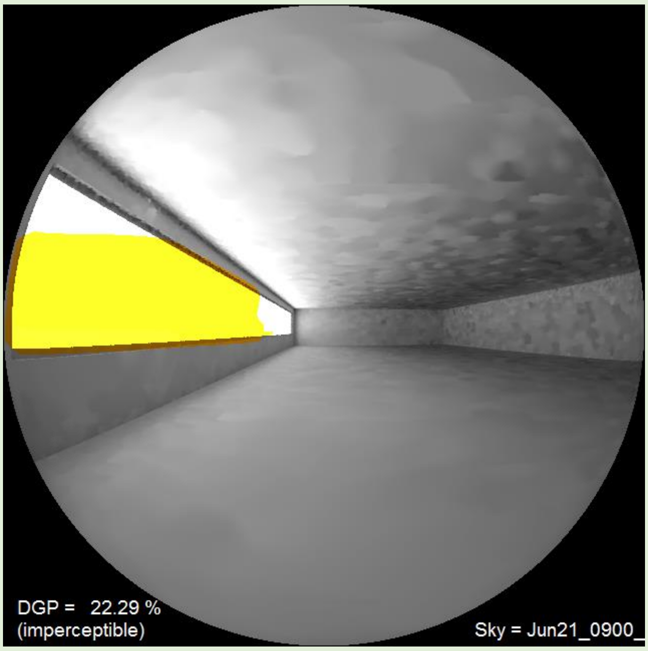

Glare indices summary
Glare Threshold = 844.70 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 459.70 474.58 466.25 415.70 349.66 281.74 217.95 161.87 115.10 77.98 50.19 0.00 0.00
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1230
Sky file = Jun21_0700_ss.sky
Glare Threshold = 844.70 cd/m² resolution = 500
0 cd/m²
Glare threshold = 844.70 cd/m²

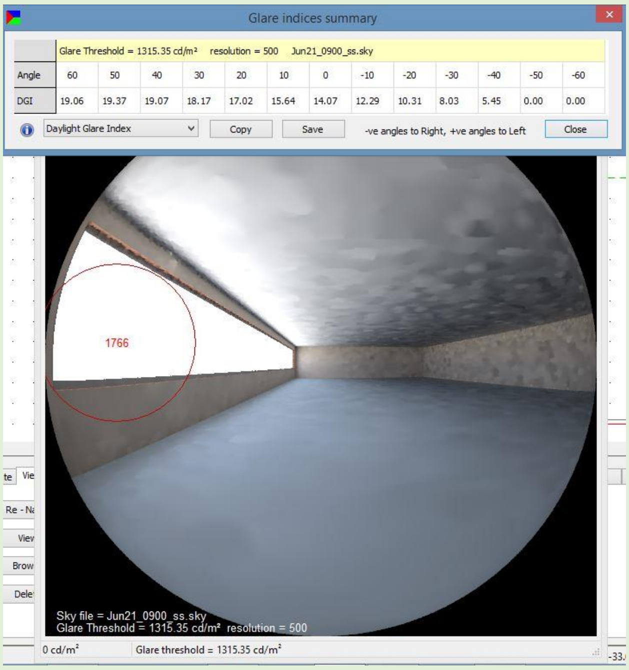
Table 233: Daylight and Glare Analysis for Jun 21, with sunny sky, (S), (P5/3m),(T9).

Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P5/3m) (T9).

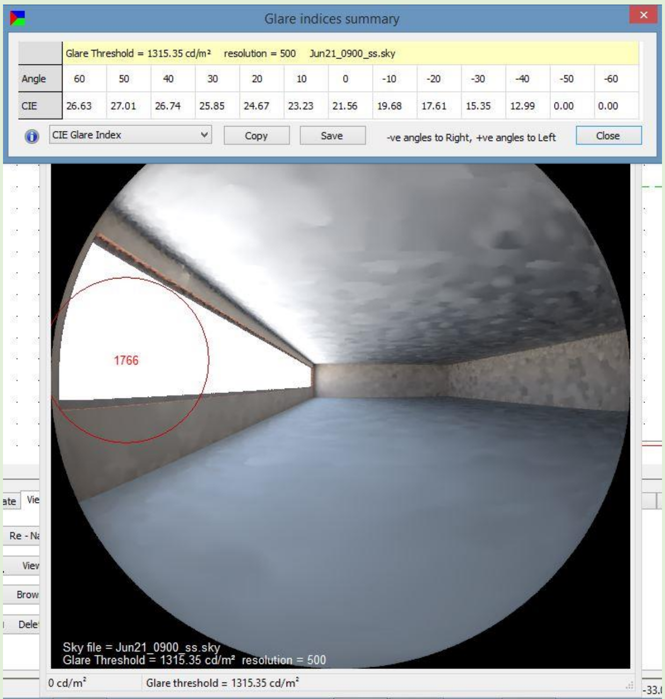
DGP



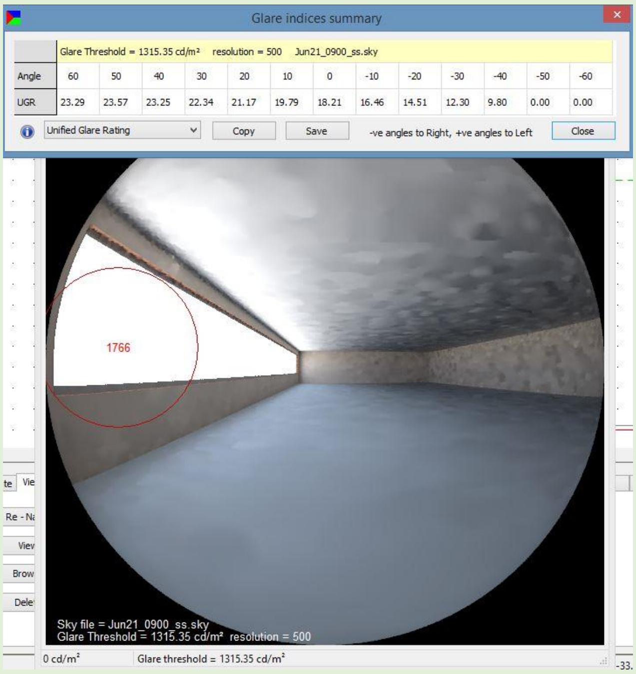
DGI



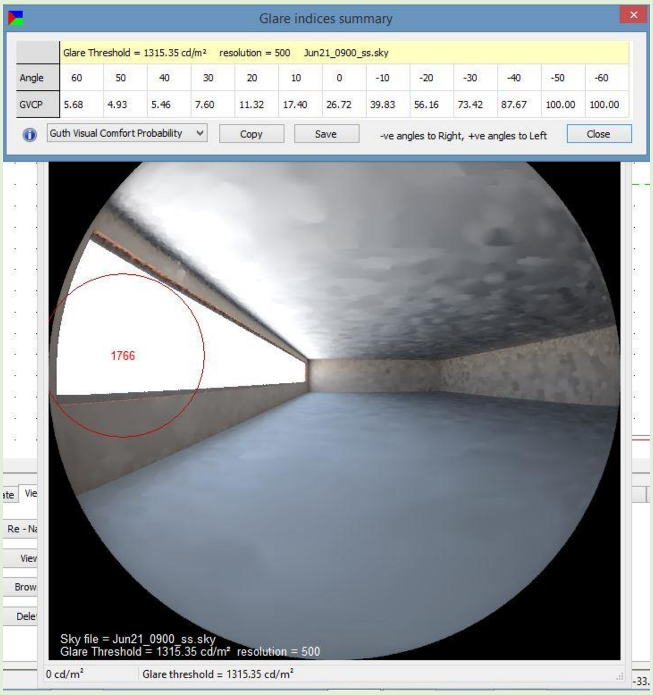
CGI



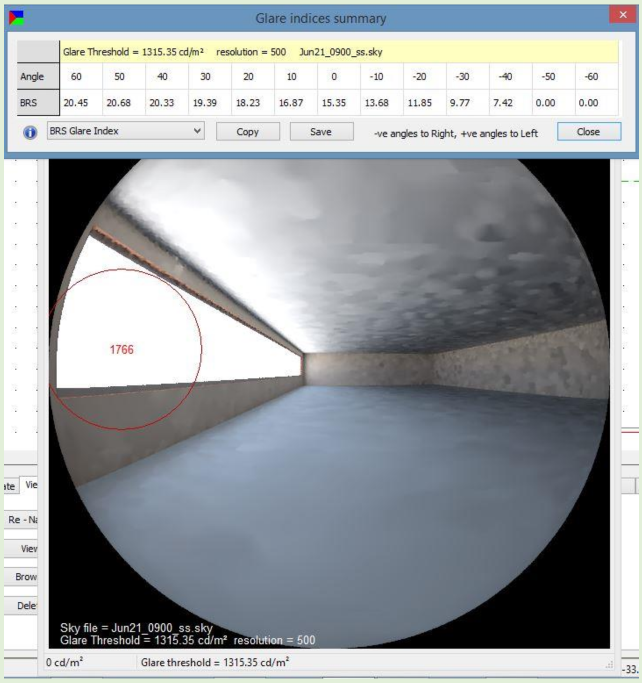
UGR



VCP


Glare indices summary
Glare Threshold = 1315.35 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 5.68 4.93 5.46 7.60 11.32 17.40 26.72 39.83 56.16 73.42 87.67 100.00 100.00
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1766
Sky file = Jun21_0900_ss.sky
Glare Threshold = 1315.35 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1315.35 cd/m²

BRS


Glare indices summary
Glare Threshold = 1315.35 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 20.45 20.68 20.33 19.39 18.23 16.87 15.35 13.68 11.85 9.77 7.42 0.00 0.00
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1766
Sky file = Jun21_0900_ss.sky
Glare Threshold = 1315.35 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1315.35 cd/m²

GDGR

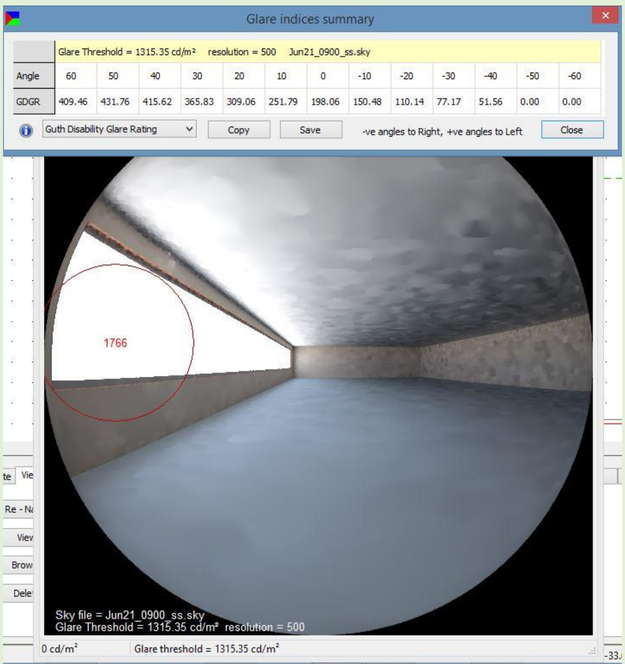
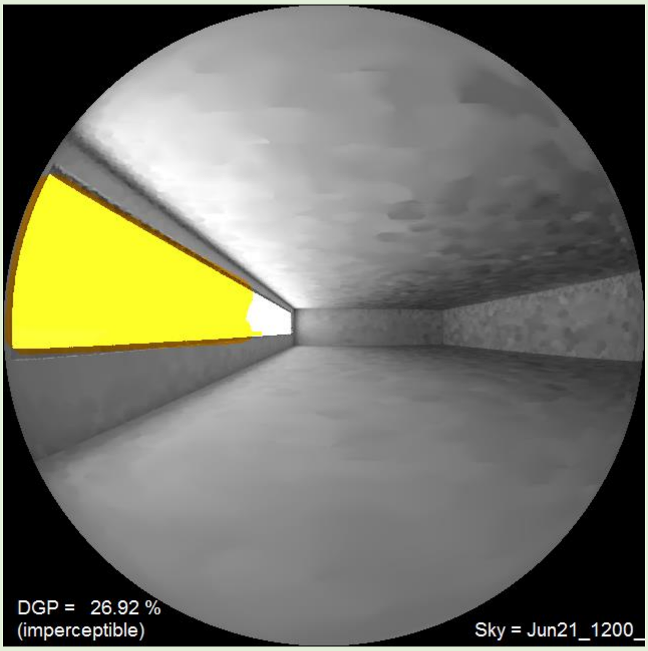

Glare indices summary
Glare Threshold = 1315.35 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 409.46 431.76 415.62 365.83 309.06 251.79 198.06 150.48 110.14 77.17 51.56 0.00 0.00
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1766
Sky file = Jun21_0900_ss.sky
Glare Threshold = 1315.35 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1315.35 cd/m²

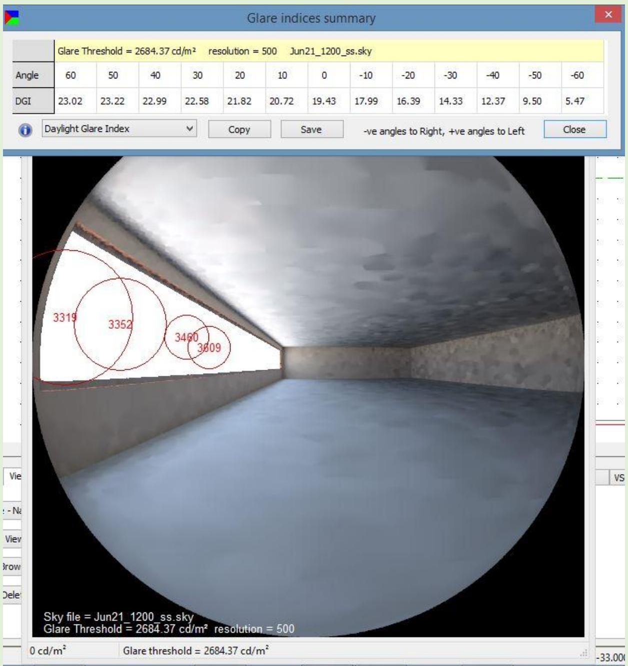
Table 234: Daylight and Glare Analysis for Jun 21, with sunny sky, (S), (P5/3m),(T12).

Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P5/3m) (T12).

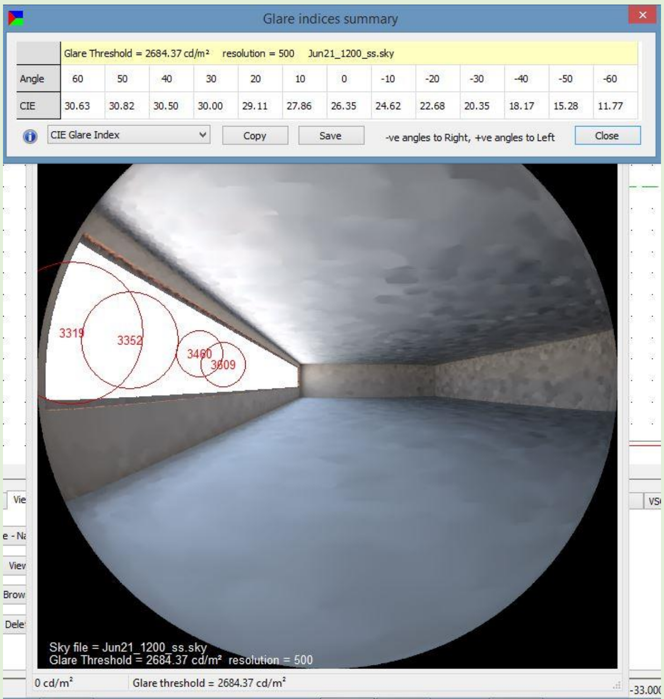
DGP



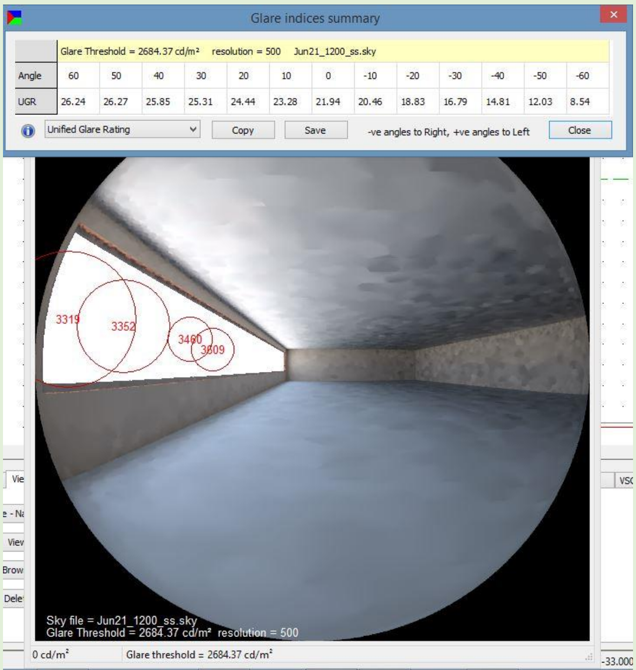
DGI



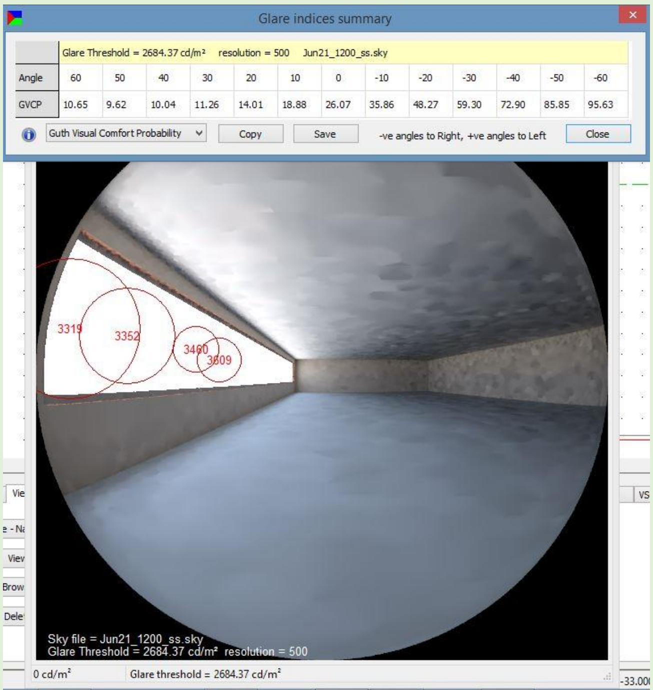
CGI



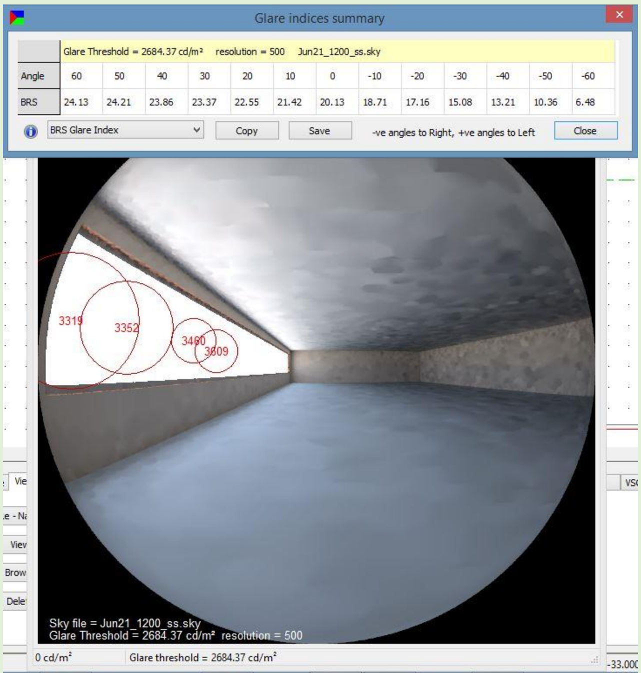
UGR



VCP


Glare indices summary
Glare Threshold = 2684.37 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 10.65 9.62 10.04 11.26 14.01 18.88 26.07 35.86 48.27 59.30 72.90 85.85 95.63
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_1200_ss.sky
Glare Threshold = 2684.37 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2684.37 cd/m²

BRS


Glare indices summary
Glare Threshold = 2684.37 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 24.13 24.21 23.86 23.37 22.55 21.42 20.13 18.71 17.16 15.08 13.21 10.36 6.48
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_1200_ss.sky
Glare Threshold = 2684.37 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2684.37 cd/m²

GDGR

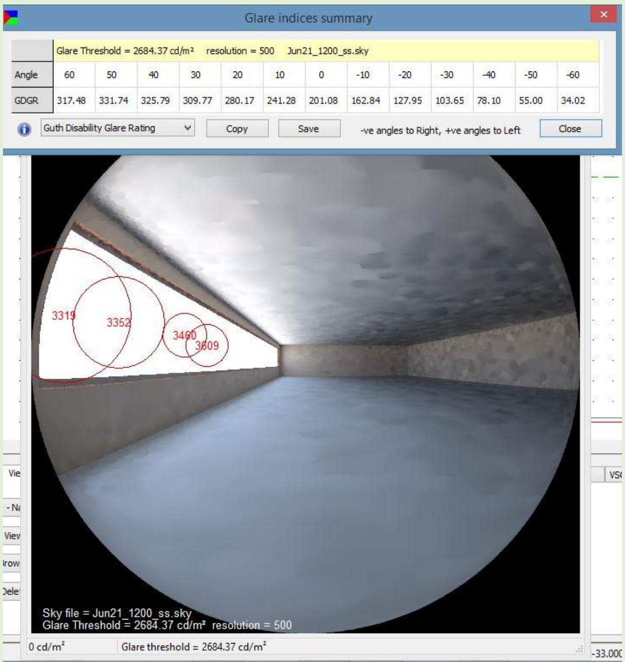
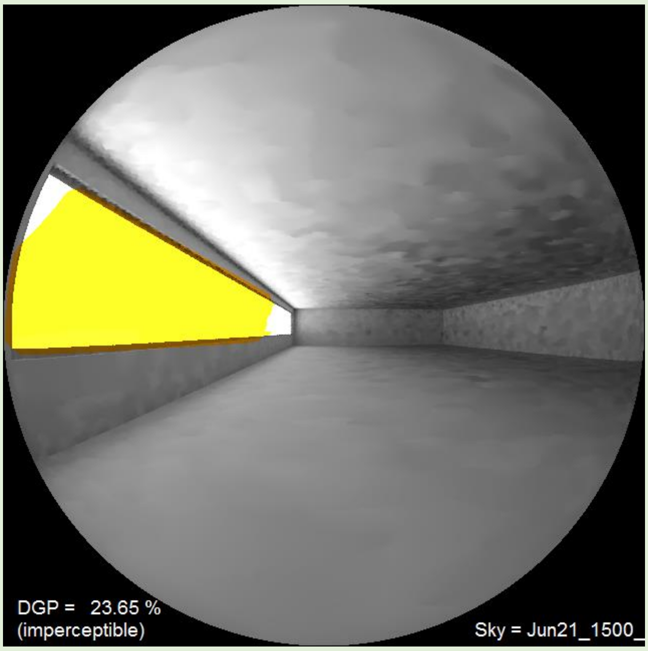

Glare indices summary
Glare Threshold = 2684.37 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 317.48 331.74 325.79 309.77 280.17 241.28 201.08 162.84 127.95 103.65 78.10 55.00 34.02
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_1200_ss.sky
Glare Threshold = 2684.37 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2684.37 cd/m²

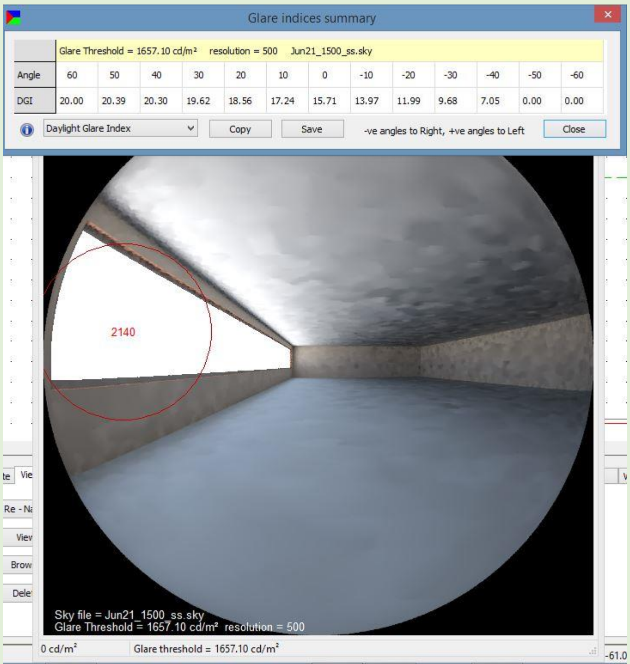
Table 235: Daylight and Glare Analysis for Jun 21, with sunny sky, (S), (P5/3m),(T15).

Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P5/3m) (T15).

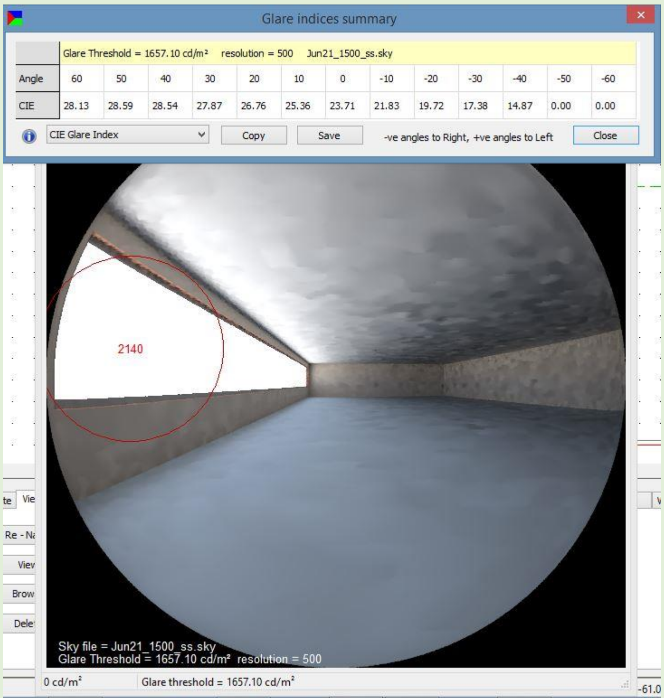
DGP



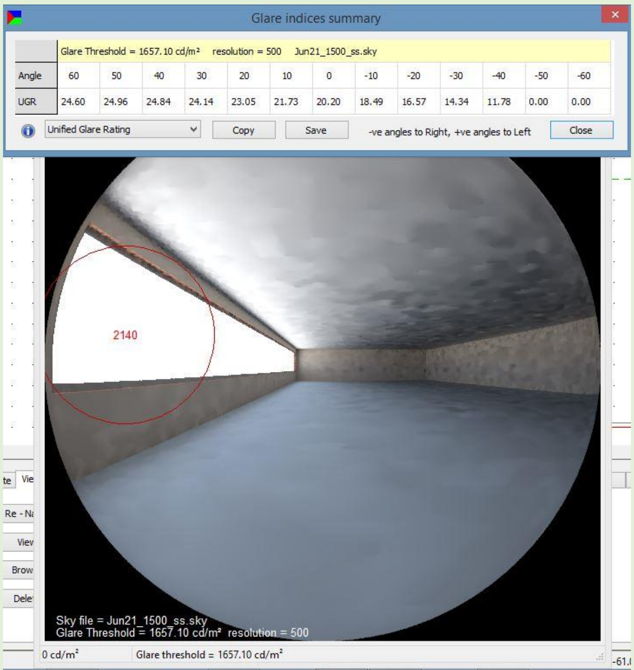
DGI



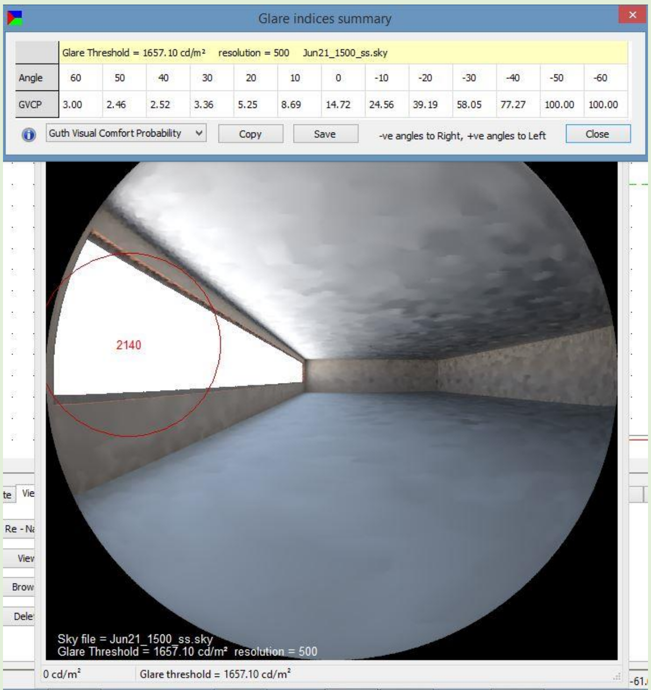
CGI



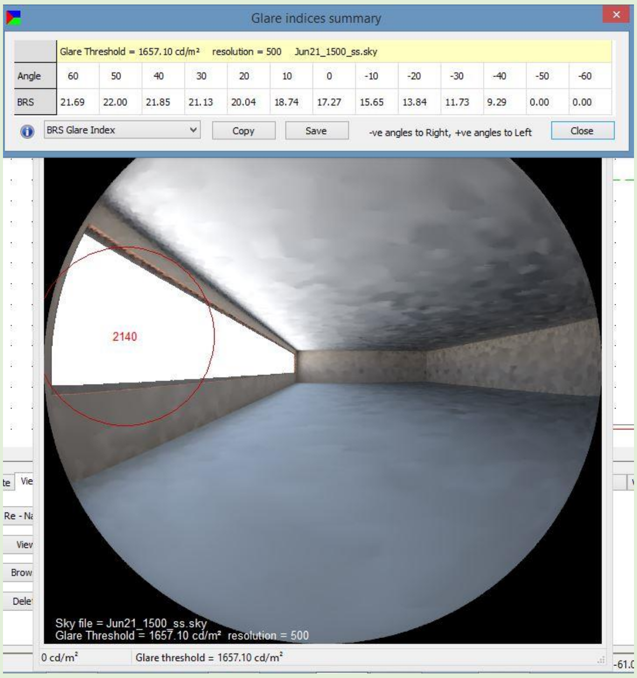
UGR



VCP


Glare indices summary
Glare Threshold = 1657.10 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 3.00 2.46 2.52 3.36 5.25 8.69 14.72 24.56 39.19 58.05 77.27 100.00 100.00
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2140
Sky file = Jun21_1500_ss.sky
Glare Threshold = 1657.10 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1657.10 cd/m²

BRS


Glare indices summary
Glare Threshold = 1657.10 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 21.69 22.00 21.85 21.13 20.04 18.74 17.27 15.65 13.84 11.73 9.29 0.00 0.00
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2140
Sky file = Jun21_1500_ss.sky
Glare Threshold = 1657.10 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1657.10 cd/m²

GDGR

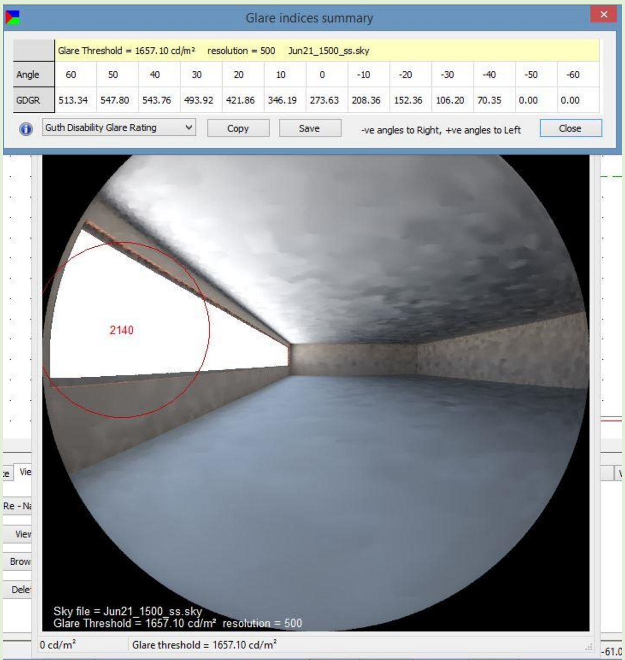
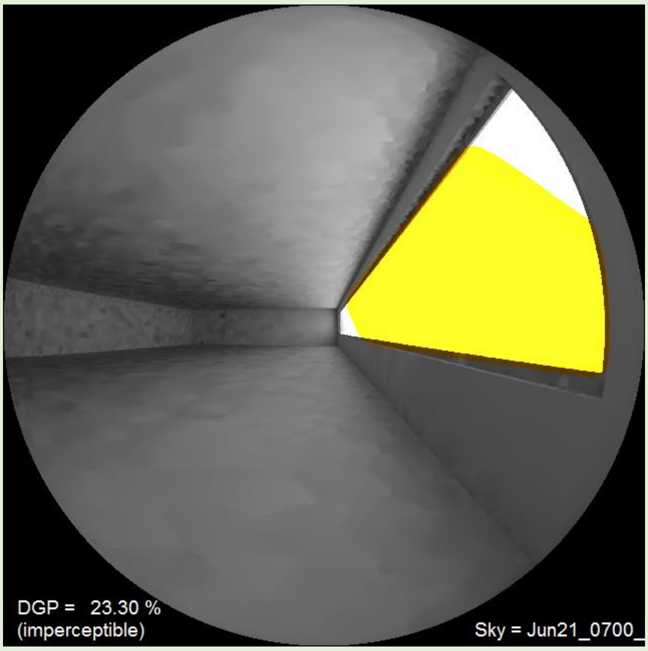

Glare indices summary
Glare Threshold = 1657.10 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 513.34 547.80 543.76 493.92 421.86 346.19 273.63 208.36 152.36 106.20 70.35 0.00 0.00
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2140
Sky file = Jun21_1500_ss.sky
Glare Threshold = 1657.10 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1657.10 cd/m²

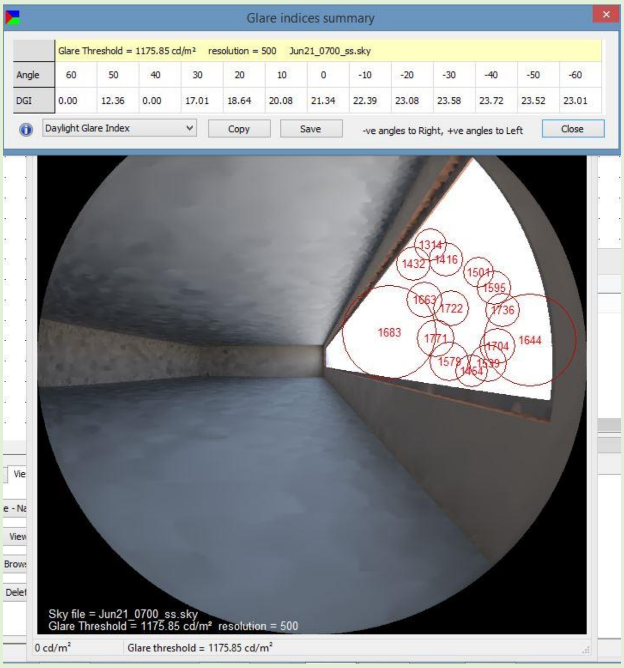
Table 236: Daylight and Glare Analysis for Jun 21, with sunny sky, (S), (P6/1.5m),(T7).

Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P6/1.5m) (T7).

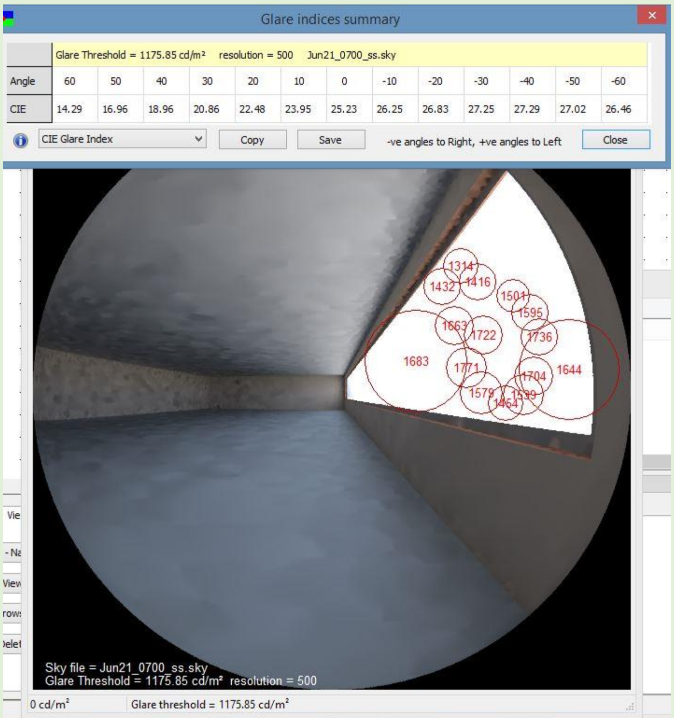
DGP



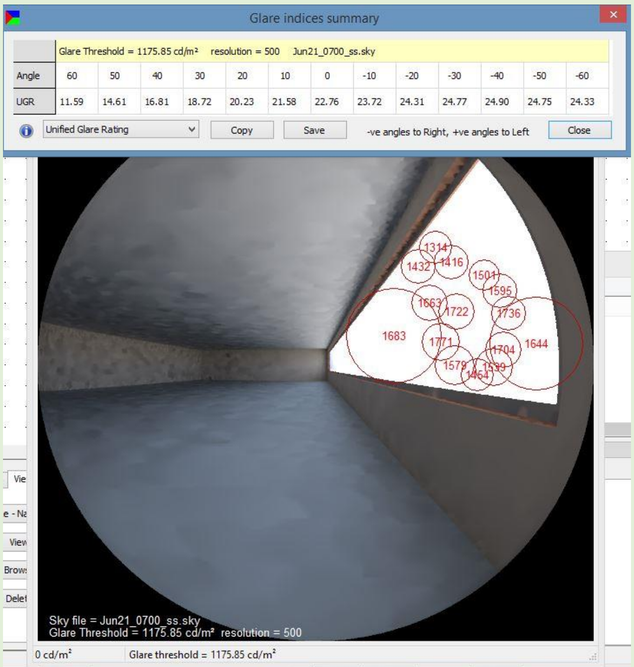
DGI



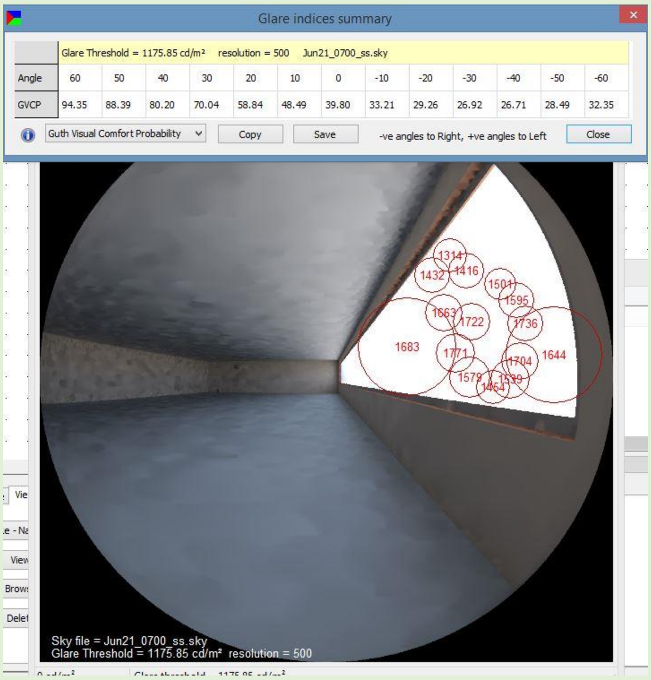
CGI



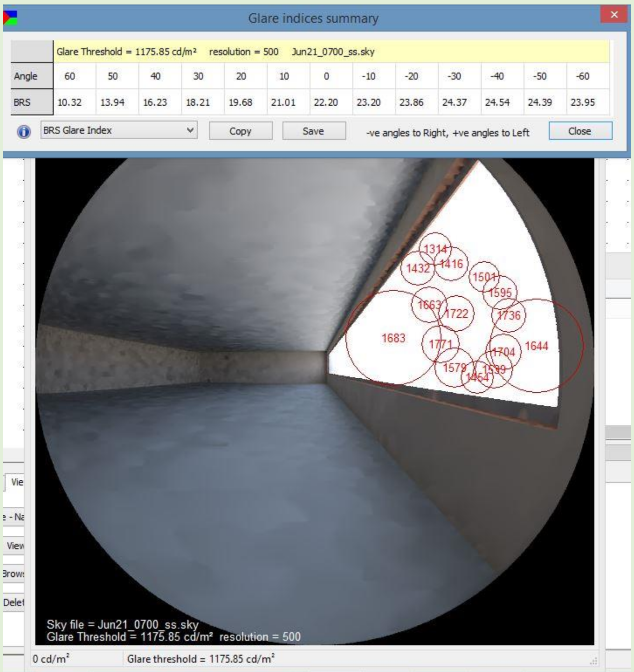
UGR



VCP


Glare indices summary
Glare Threshold = 1175.85 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 94.35 88.39 80.20 70.04 58.84 48.49 39.80 33.21 29.26 26.92 26.71 28.49 32.35
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_0700_ss.sky
Glare Threshold = 1175.85 cd/m² resolution = 500

BRS


Glare indices summary
Glare Threshold = 1175.85 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 10.32 13.94 16.23 18.21 19.68 21.01 22.20 23.20 23.86 24.37 24.54 24.39 23.95
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_0700_ss.sky
Glare Threshold = 1175.85 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1175.85 cd/m²

GDGR

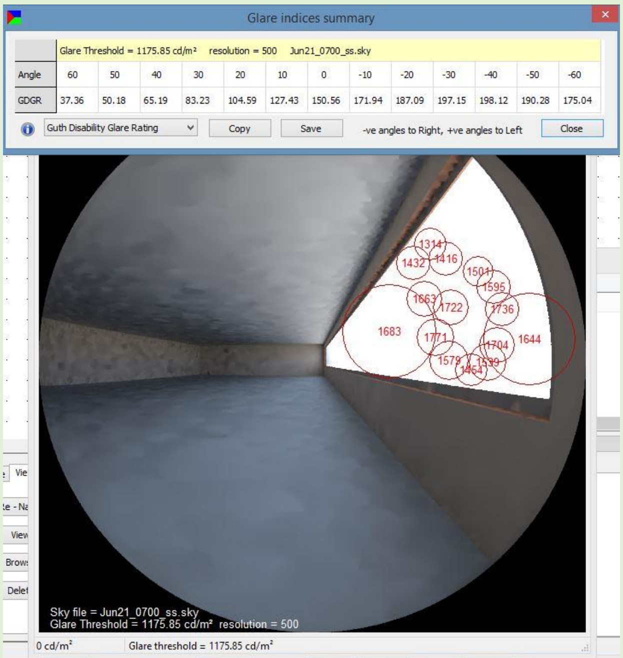
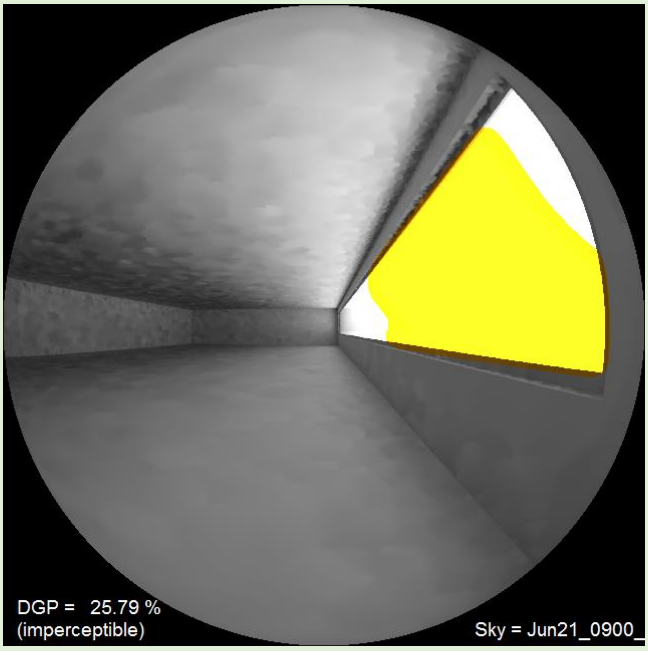

Glare indices summary
Glare Threshold = 1175.85 cd/m² resolution = 500 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 37.36 50.18 65.19 83.23 104.59 127.43 150.56 171.94 187.09 197.15 198.12 190.28 175.04
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
Sky file = Jun21_0700_ss.sky
Glare Threshold = 1175.85 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1175.85 cd/m²

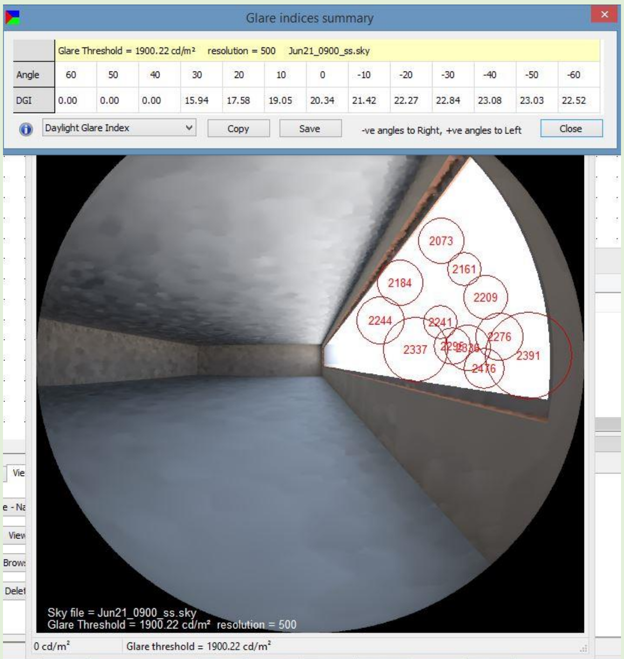
Table 237: Daylight and Glare Analysis for Jun 21, with sunny sky, (S), (P6/1.5m),(T9).

Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P6/1.5m) (T9).

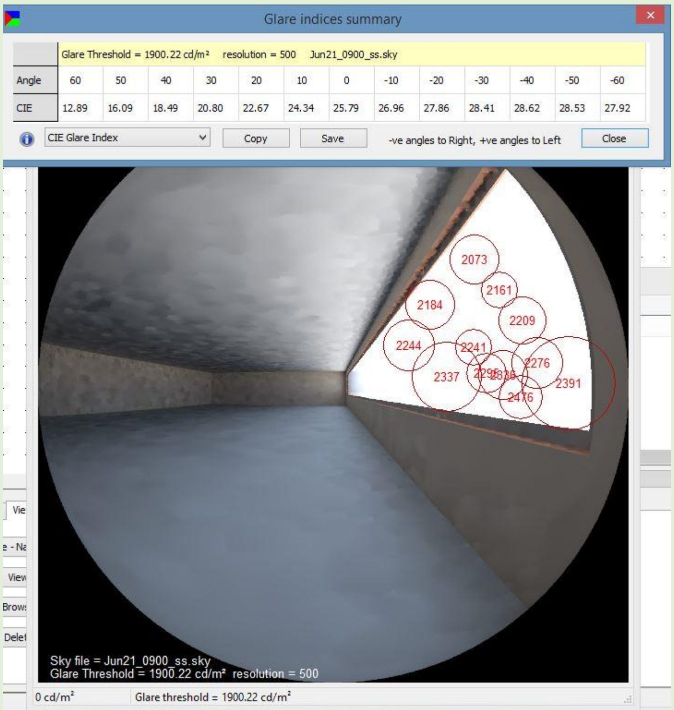
DGP



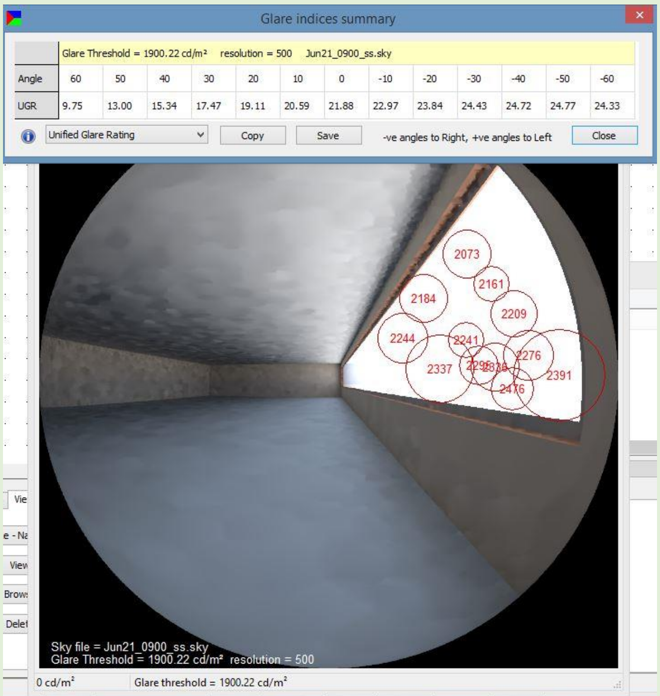
DGI



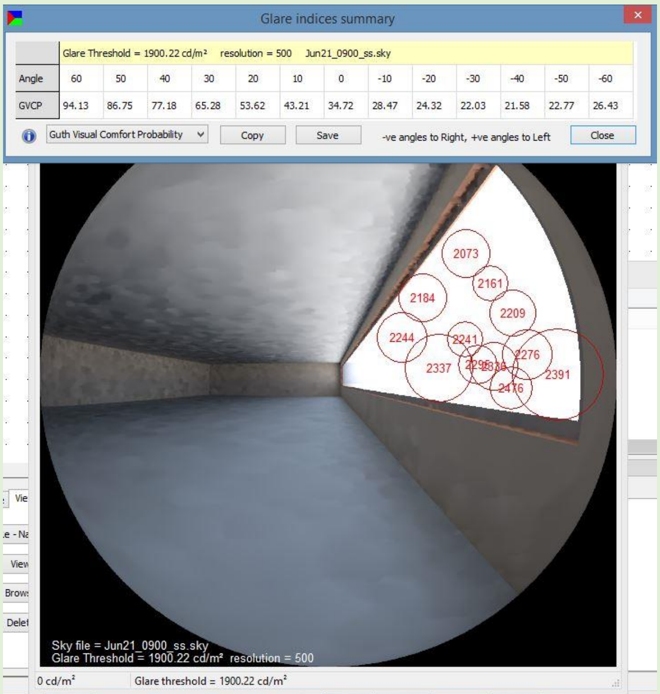
CGI



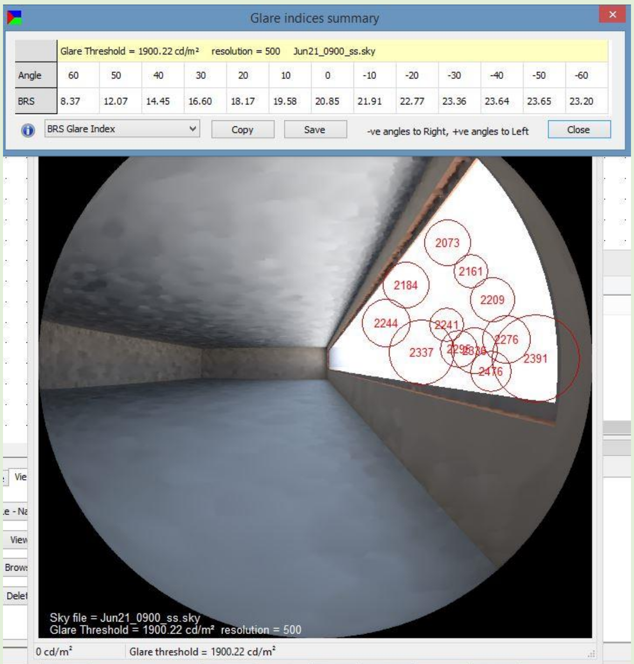
UGR



VCP


Glare indices summary
Glare Threshold = 1900.22 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 94.13 86.75 77.18 65.28 53.62 43.21 34.72 28.47 24.32 22.03 21.58 22.77 26.43
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2073
2161
2184
2209
2244
2241
2337
2276
2391
2476
Sky file = Jun21_0900_ss.sky
Glare Threshold = 1900.22 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1900.22 cd/m²

BRS


Glare indices summary
Glare Threshold = 1900.22 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 8.37 12.07 14.45 16.60 18.17 19.58 20.85 21.91 22.77 23.36 23.64 23.65 23.20
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2073
2161
2184
2209
2244
2241
2337
2276
2391
2476
Sky file = Jun21_0900_ss.sky
Glare Threshold = 1900.22 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1900.22 cd/m²

GDGR

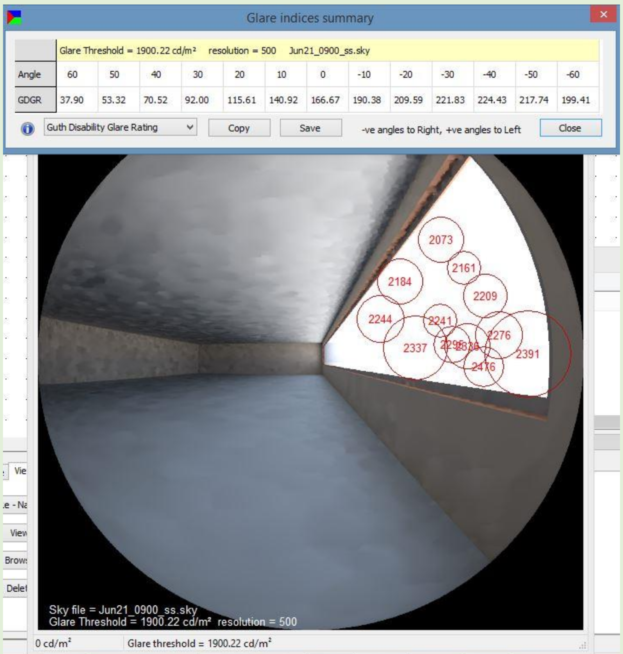
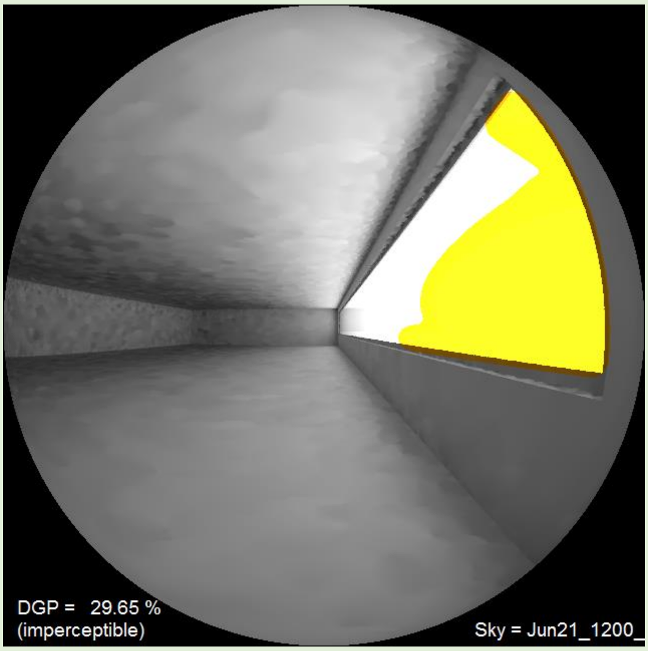

Glare indices summary
Glare Threshold = 1900.22 cd/m² resolution = 500 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 37.90 53.32 70.52 92.00 115.61 140.92 166.67 190.38 209.59 221.83 224.43 217.74 199.41
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2073
2161
2184
2209
2244
2241
2337
2276
2391
2476
Sky file = Jun21_0900_ss.sky
Glare Threshold = 1900.22 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1900.22 cd/m²

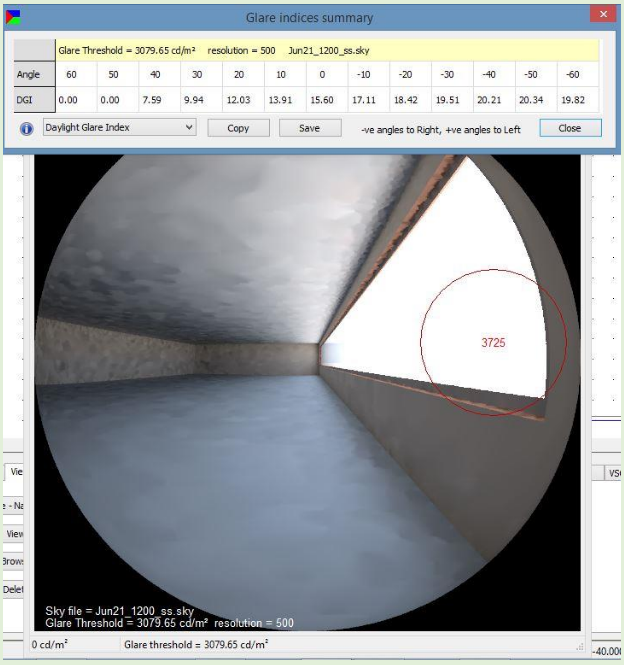
Table 238: Daylight and Glare Analysis for Jun 21, with sunny sky, (S), (P6/1.5m),(T12).

Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P6/1.5m) (T12).

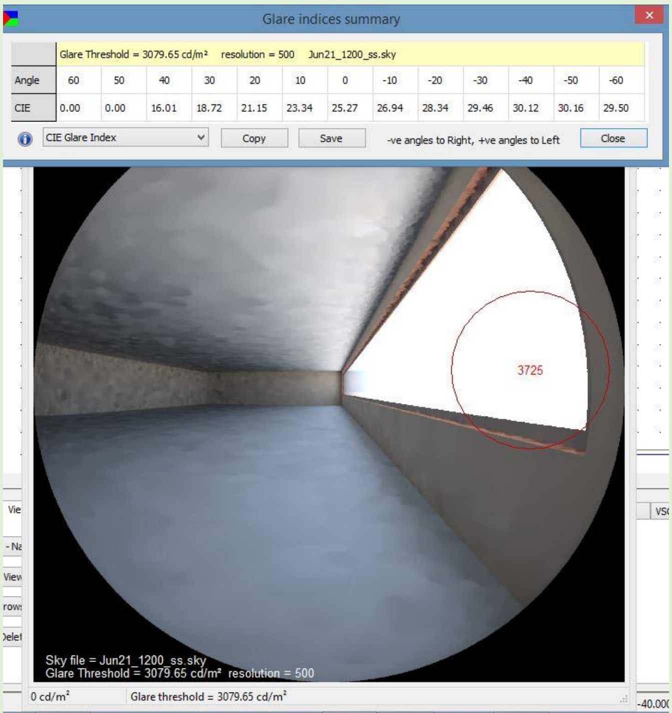
DGP



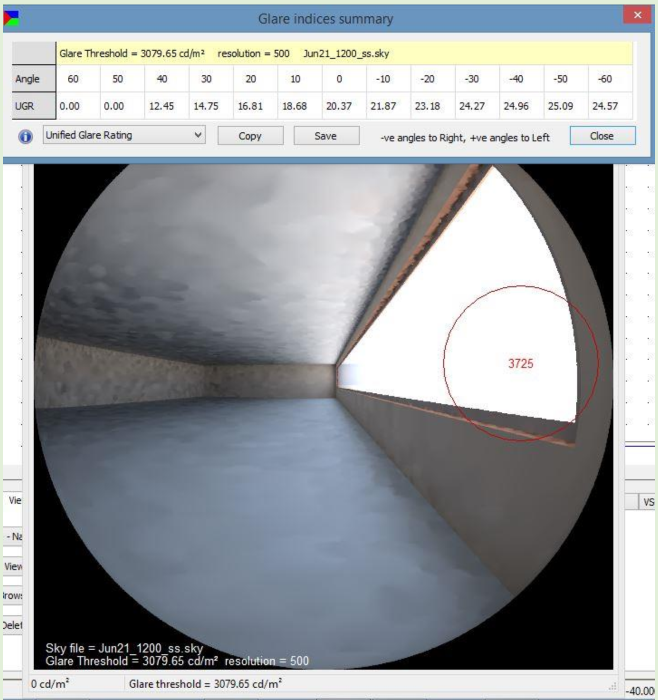
DGI



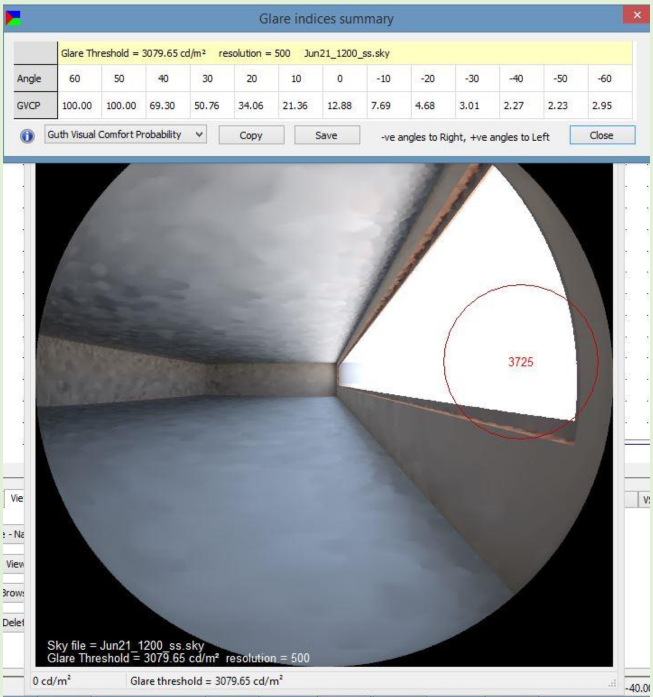
CGI



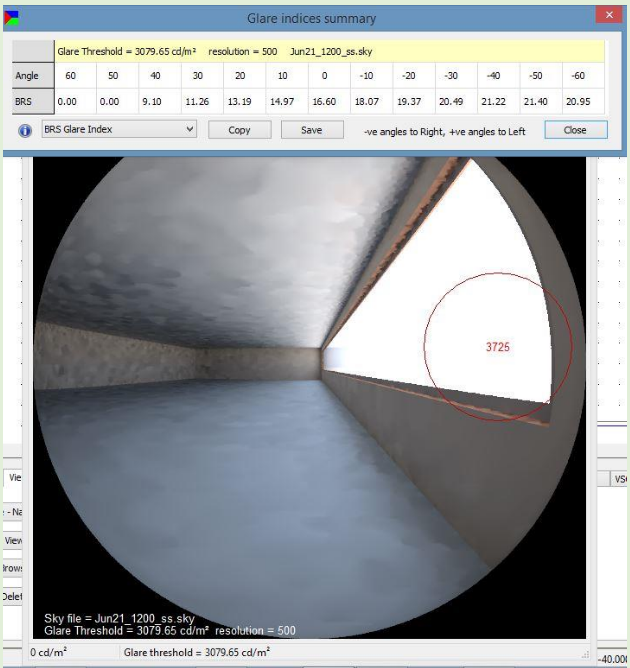
UGR



VCP


Glare indices summary
Glare Threshold = 3079.65 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 100.00 100.00 69.30 50.76 34.06 21.36 12.88 7.69 4.68 3.01 2.27 2.23 2.95
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3725
Sky file = Jun21_1200_ss.sky
Glare Threshold = 3079.65 cd/m² resolution = 500
0 cd/m²
Glare threshold = 3079.65 cd/m²

BRS


Glare indices summary
Glare Threshold = 3079.65 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 0.00 0.00 9.10 11.26 13.19 14.97 16.60 18.07 19.37 20.49 21.22 21.40 20.95
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3725
Sky file = Jun21_1200_ss.sky
Glare Threshold = 3079.65 cd/m² resolution = 500
0 cd/m²
Glare threshold = 3079.65 cd/m²

GDGR

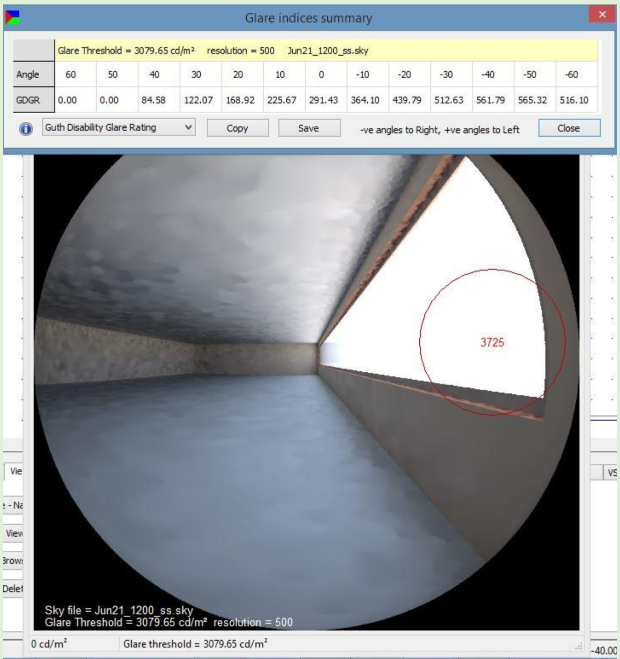
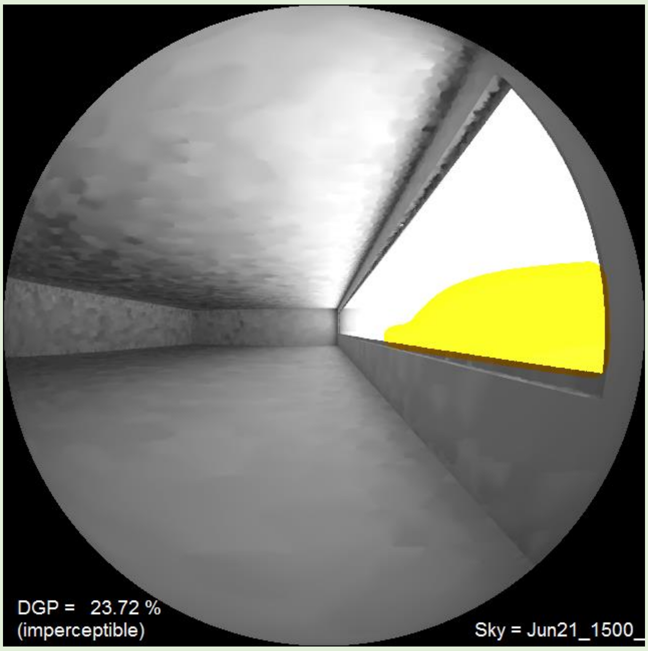

Glare indices summary
Glare Threshold = 3079.65 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 0.00 0.00 84.58 122.07 168.92 225.67 291.43 364.10 439.79 512.63 561.79 565.32 516.10
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3725
Sky file = Jun21_1200_ss.sky
Glare Threshold = 3079.65 cd/m² resolution = 500
0 cd/m²
Glare threshold = 3079.65 cd/m²

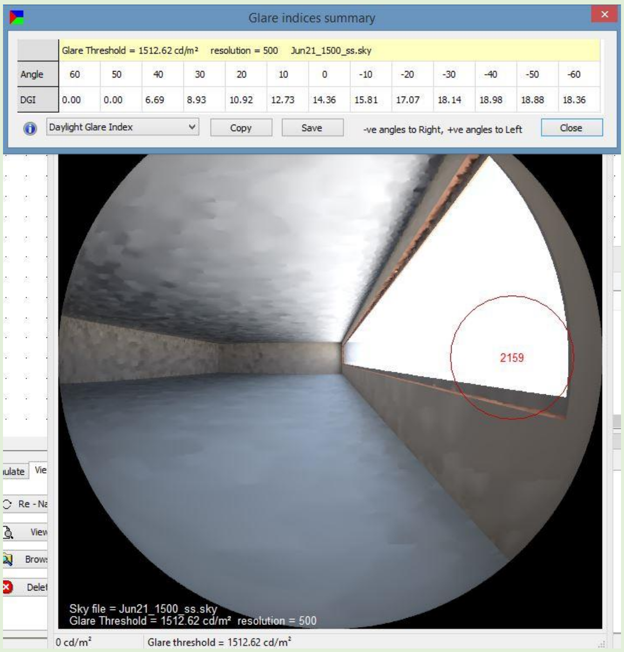
Table 239: Daylight and Glare Analysis for Jun 21, with sunny sky, (S), (P6/1.5m),(T15).

Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P6/1.5m) (T15).

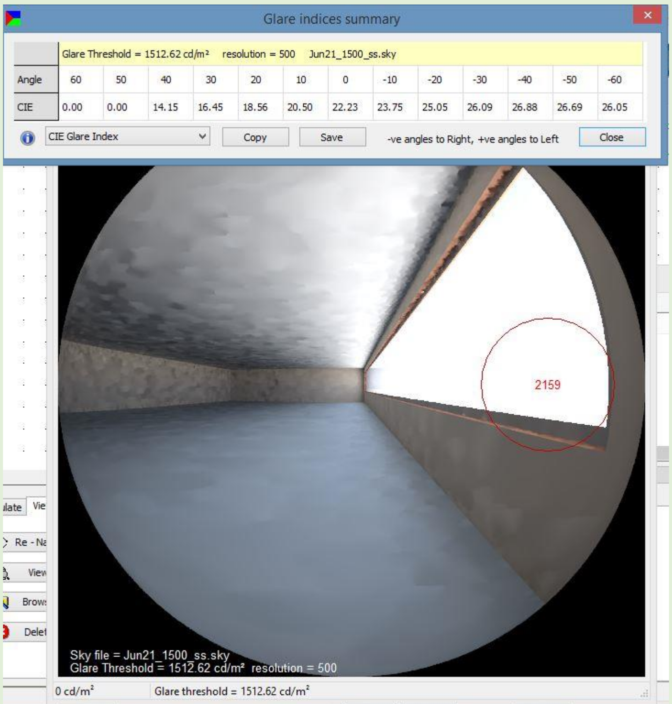
DGP



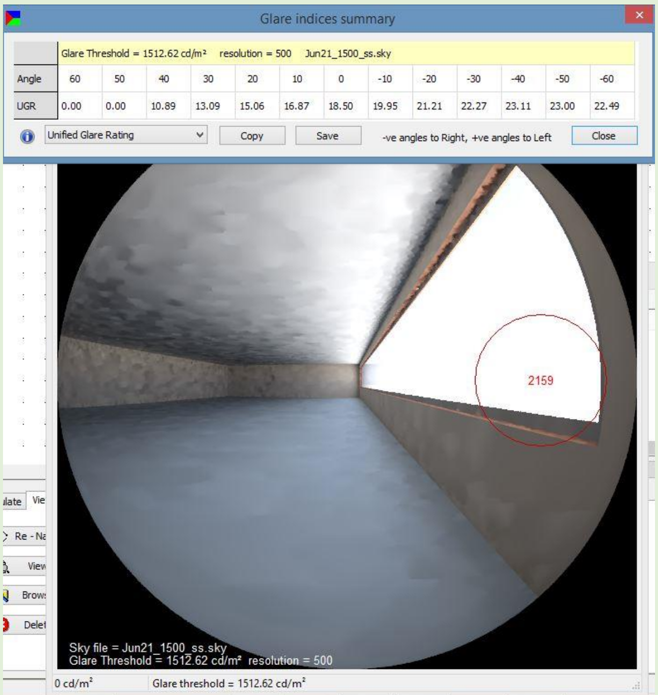
DGI



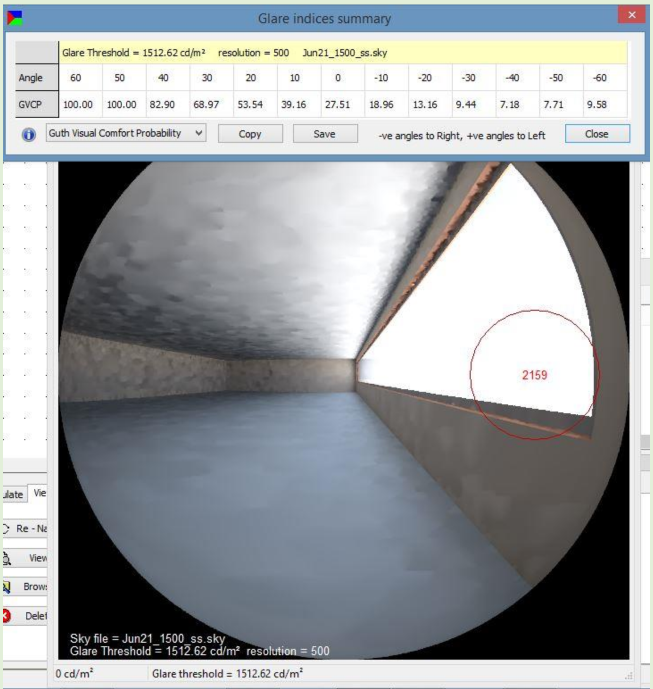
CGI



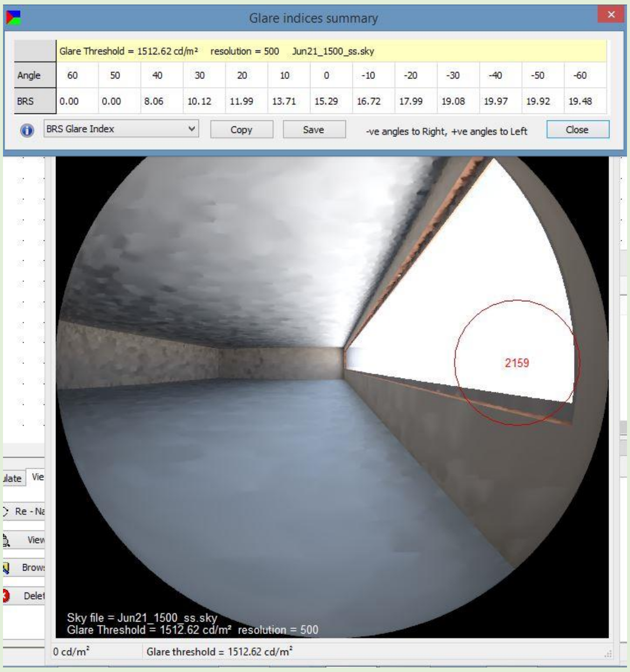
UGR



VCP


Glare indices summary
Glare Threshold = 1512.62 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 100.00 100.00 82.90 68.97 53.54 39.16 27.51 18.96 13.16 9.44 7.18 7.71 9.58
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2159
Sky file = Jun21_1500_ss.sky
Glare Threshold = 1512.62 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1512.62 cd/m²

BRS


Glare indices summary
Glare Threshold = 1512.62 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 0.00 0.00 8.06 10.12 11.99 13.71 15.29 16.72 17.99 19.08 19.97 19.92 19.48
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2159
Sky file = Jun21_1500_ss.sky
Glare Threshold = 1512.62 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1512.62 cd/m²

GDGR

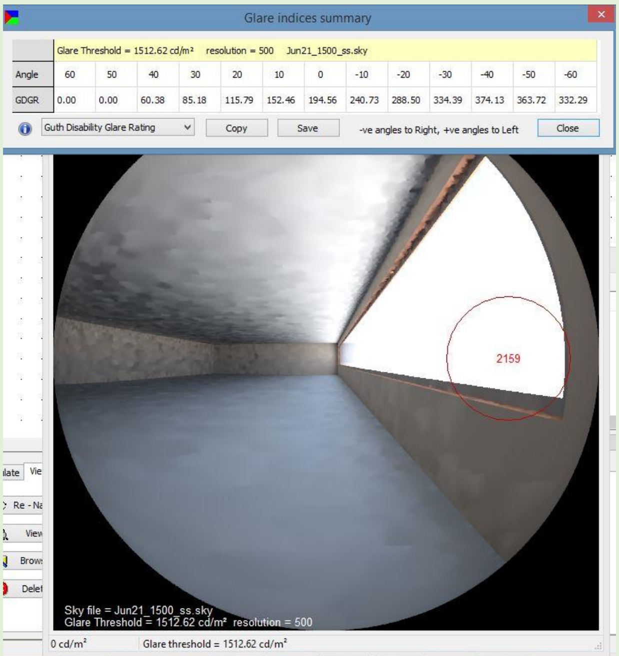
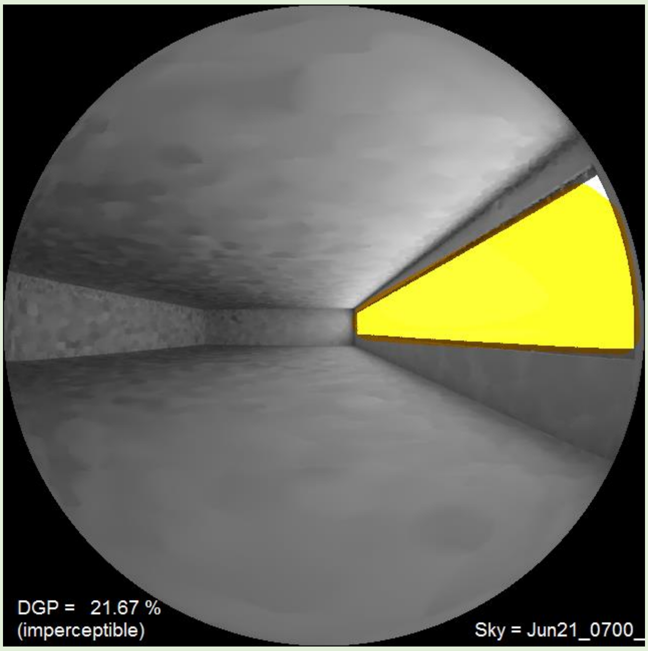

Glare indices summary
Glare Threshold = 1512.62 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 0.00 0.00 60.38 85.18 115.79 152.46 194.56 240.73 288.50 334.39 374.13 363.72 332.29
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2159
Sky file = Jun21_1500_ss.sky
Glare Threshold = 1512.62 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1512.62 cd/m²

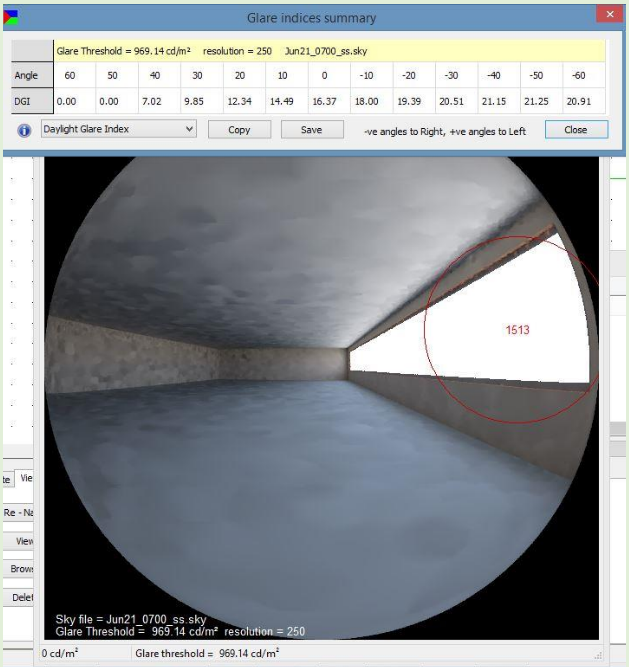
Table 240: Daylight and Glare Analysis for Jun 21, with sunny sky, (S), (P6/3m),(T7).

Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P6/3m) (T7).

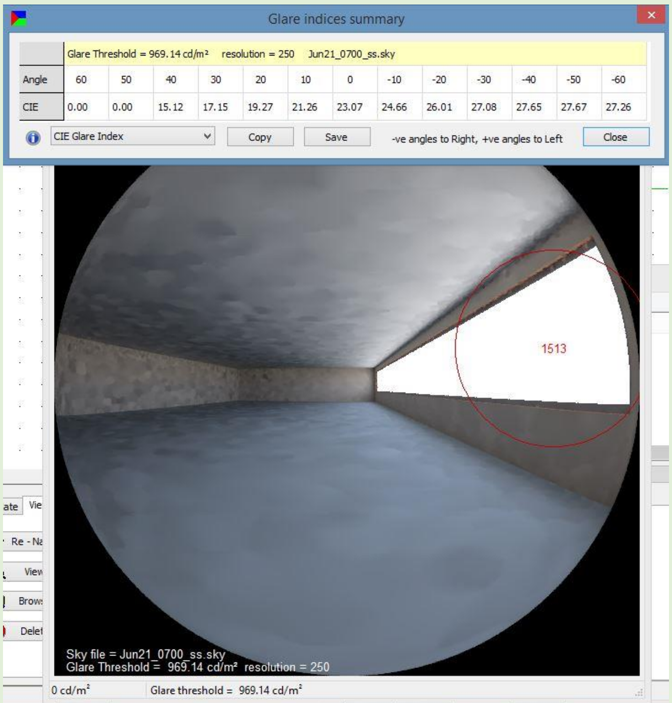
DGP



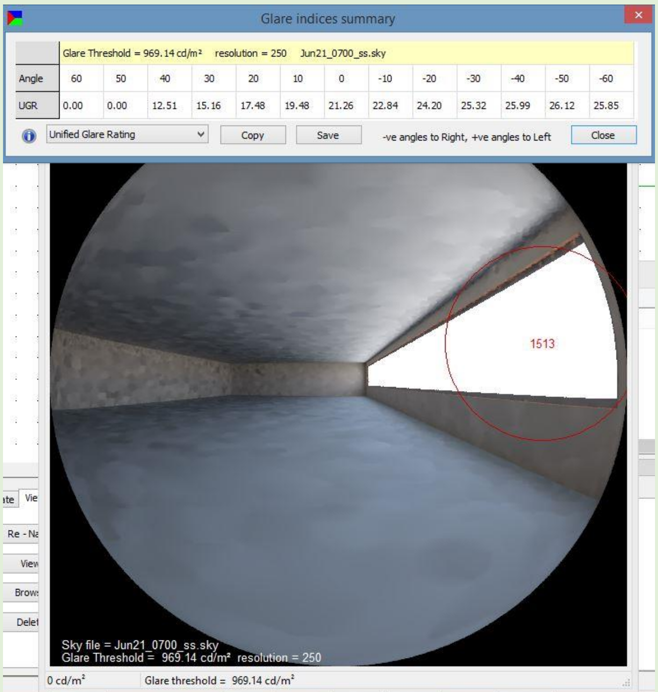
DGI



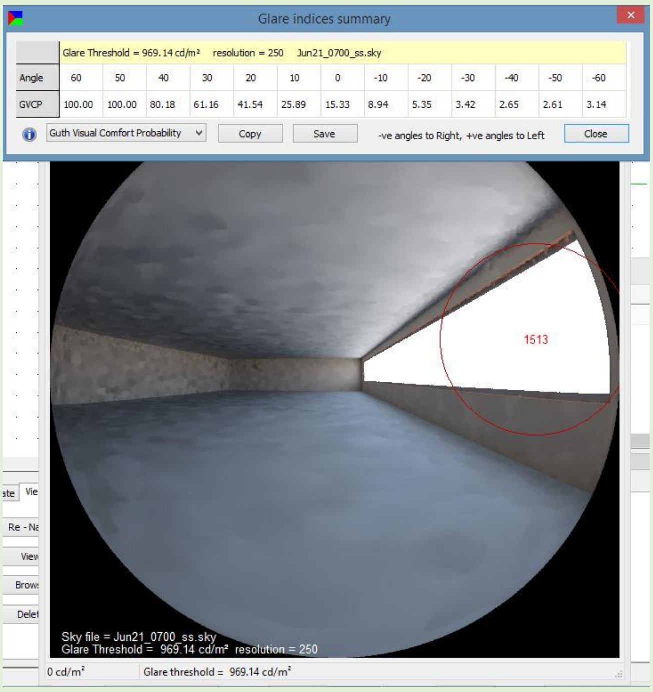
CGI



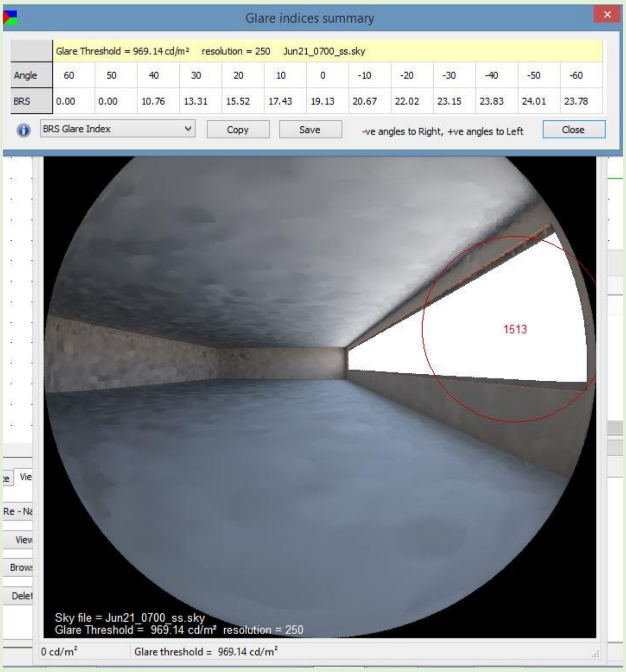
UGR



VCP


Glare indices summary
Glare Threshold = 969.14 cd/m² resolution = 250 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 100.00 100.00 80.18 61.16 41.54 25.89 15.33 8.94 5.35 3.42 2.65 2.61 3.14
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1513
Sky file = Jun21_0700_ss.sky
Glare Threshold = 969.14 cd/m² resolution = 250
0 cd/m²
Glare threshold = 969.14 cd/m²

BRS


Glare indices summary
Glare Threshold = 969.14 cd/m² resolution = 250 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 0.00 0.00 10.76 13.31 15.52 17.43 19.13 20.67 22.02 23.15 23.83 24.01 23.78
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1513
Sky file = Jun21_0700_ss.sky
Glare Threshold = 969.14 cd/m² resolution = 250
0 cd/m²
Glare threshold = 969.14 cd/m²

GDGR

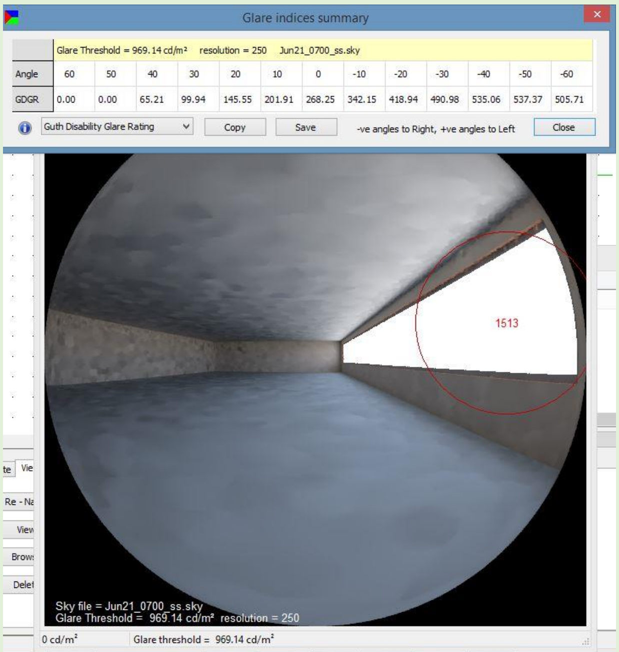
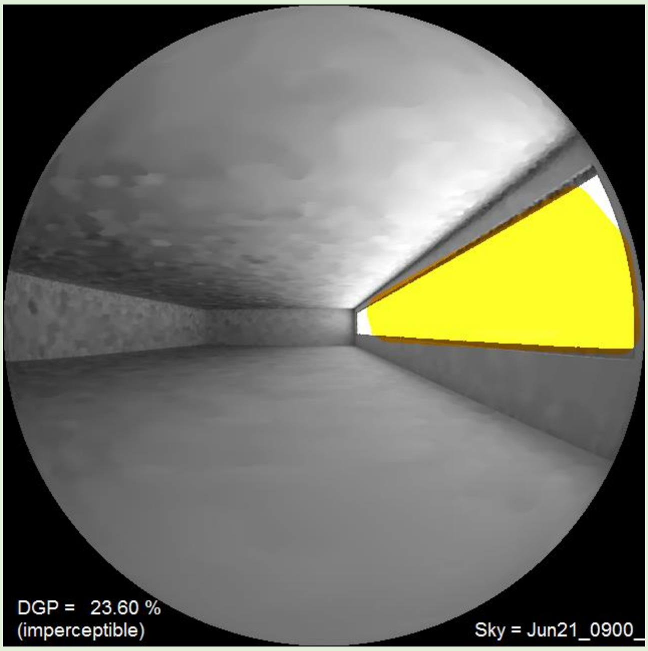

Glare indices summary
Glare Threshold = 969.14 cd/m² resolution = 250 Jun21_0700_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 0.00 0.00 65.21 99.94 145.55 201.91 268.25 342.15 418.94 490.98 535.06 537.37 505.71
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1513
Sky file = Jun21_0700_ss.sky
Glare Threshold = 969.14 cd/m² resolution = 250
0 cd/m²
Glare threshold = 969.14 cd/m²

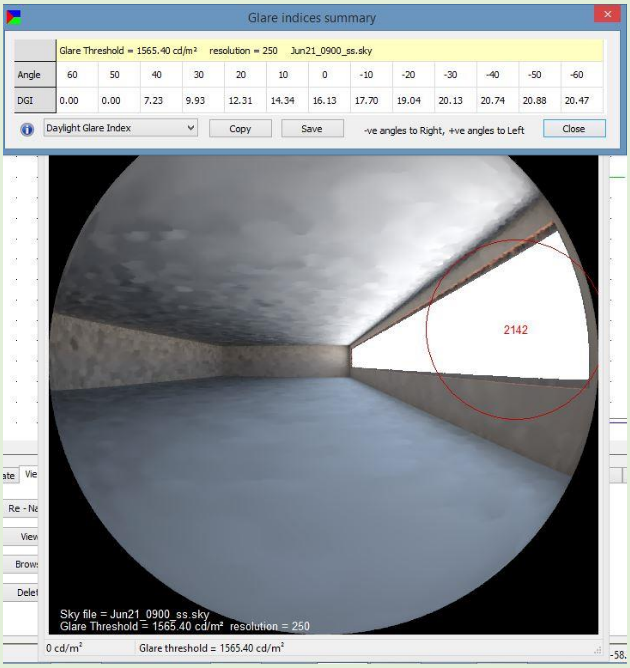
Table 241: Daylight and Glare Analysis for Jun 21, with sunny sky, (S), (P6/3m),(T9).

Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P6/3m) (T9).

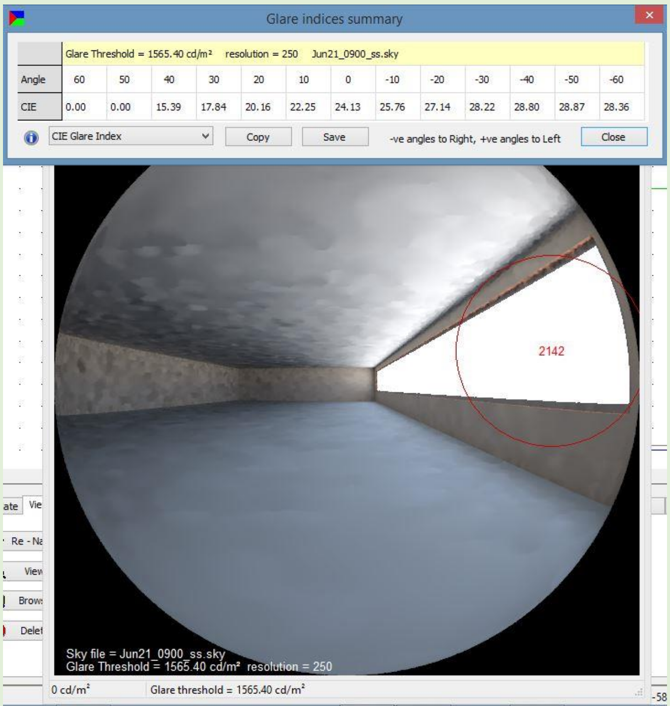
DGP



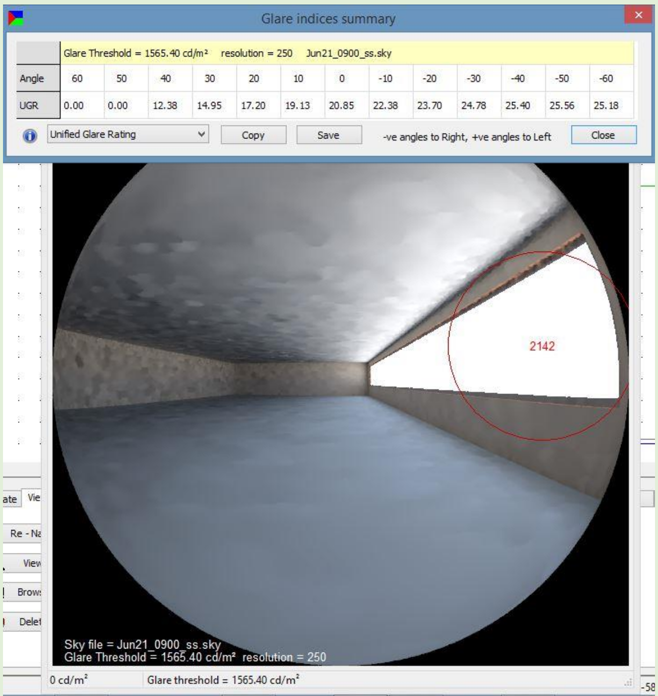
DGI



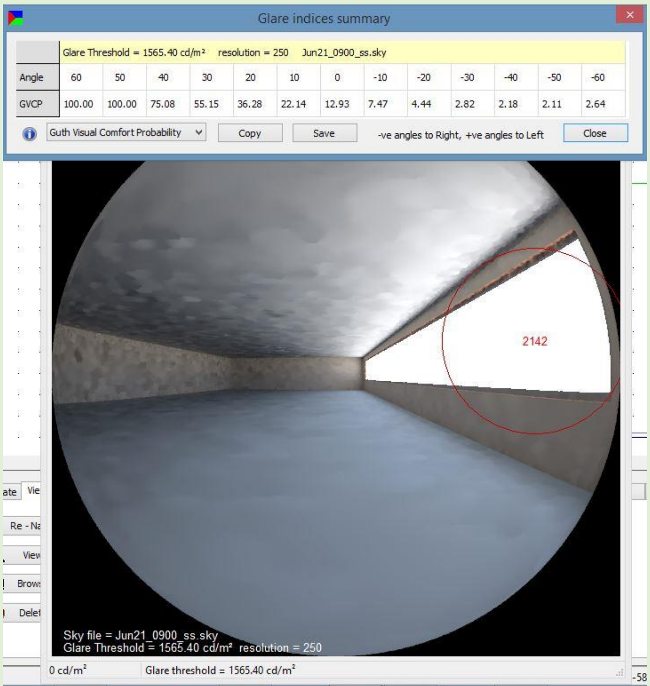
CGI



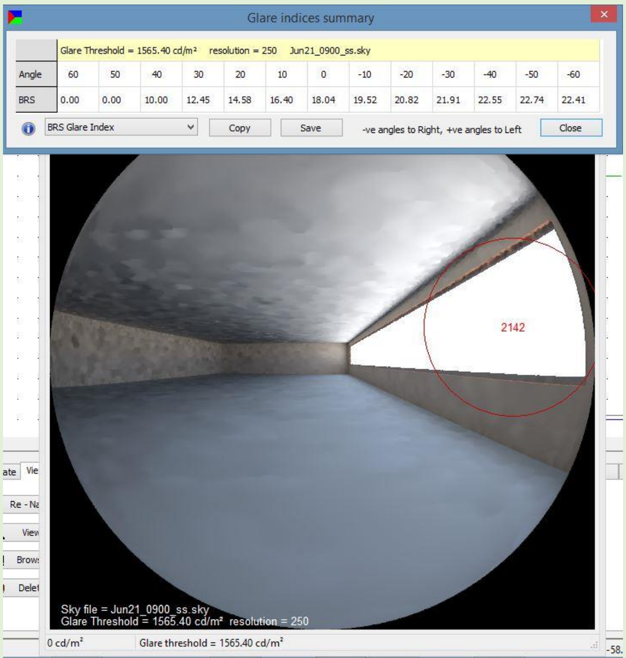
UGR



VCP


Glare indices summary
Glare Threshold = 1565.40 cd/m² resolution = 250 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 100.00 100.00 75.08 55.15 36.28 22.14 12.93 7.47 4.44 2.82 2.18 2.11 2.64
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2142
Sky file = Jun21_0900_ss.sky
Glare Threshold = 1565.40 cd/m² resolution = 250
0 cd/m²
Glare threshold = 1565.40 cd/m²

BRS


Glare indices summary
Glare Threshold = 1565.40 cd/m² resolution = 250 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 0.00 0.00 10.00 12.45 14.58 16.40 18.04 19.52 20.82 21.91 22.55 22.74 22.41
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2142
Sky file = Jun21_0900_ss.sky
Glare Threshold = 1565.40 cd/m² resolution = 250
0 cd/m²
Glare threshold = 1565.40 cd/m²

GDGR

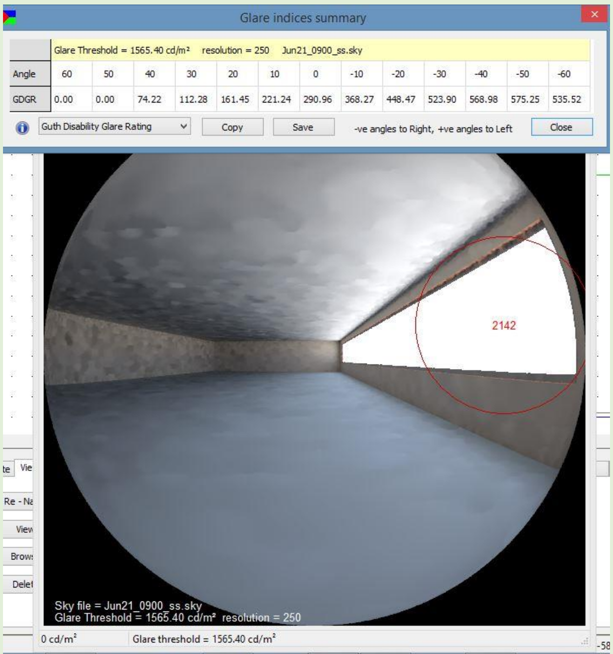
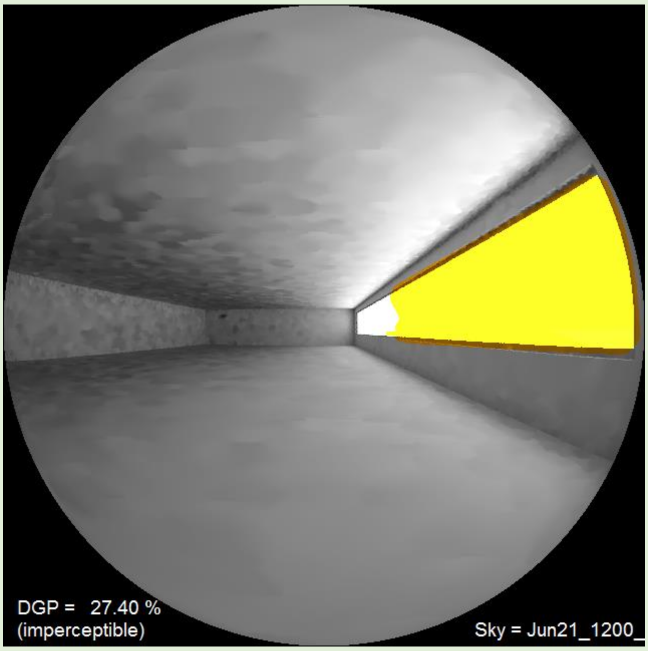

Glare indices summary
Glare Threshold = 1565.40 cd/m² resolution = 250 Jun21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 0.00 0.00 74.22 112.28 161.45 221.24 290.96 368.27 448.47 523.90 568.98 575.25 535.52
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2142
Sky file = Jun21_0900_ss.sky
Glare Threshold = 1565.40 cd/m² resolution = 250
0 cd/m²
Glare threshold = 1565.40 cd/m²

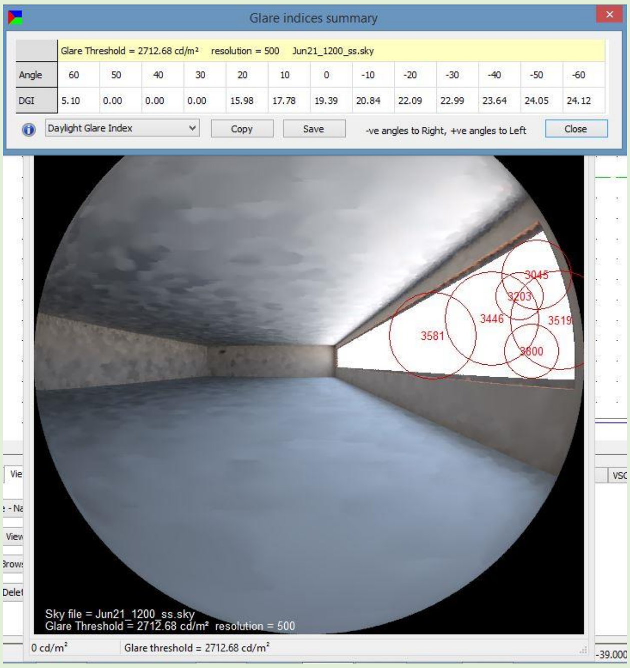
Table 242: Daylight and Glare Analysis for Jun 21, with sunny sky, (S), (P6/3m),(T12).

Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P6/3m) (T12).

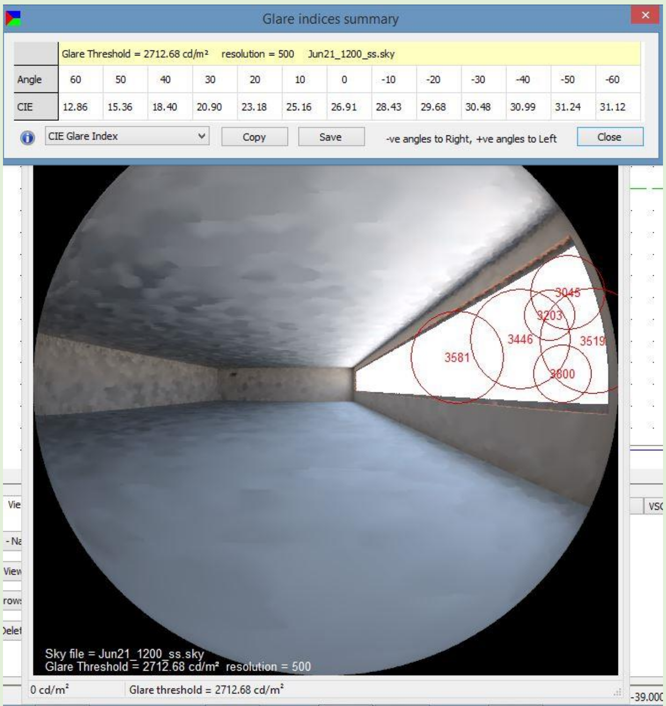
DGP



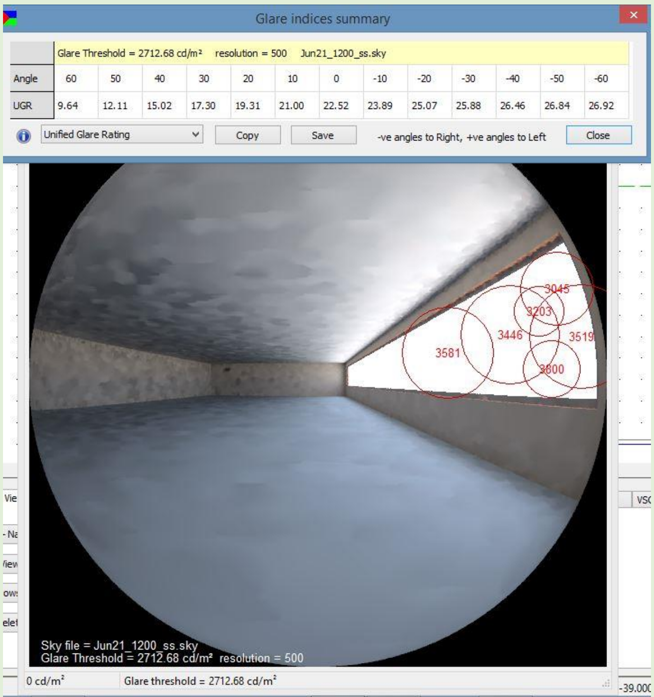
DGI



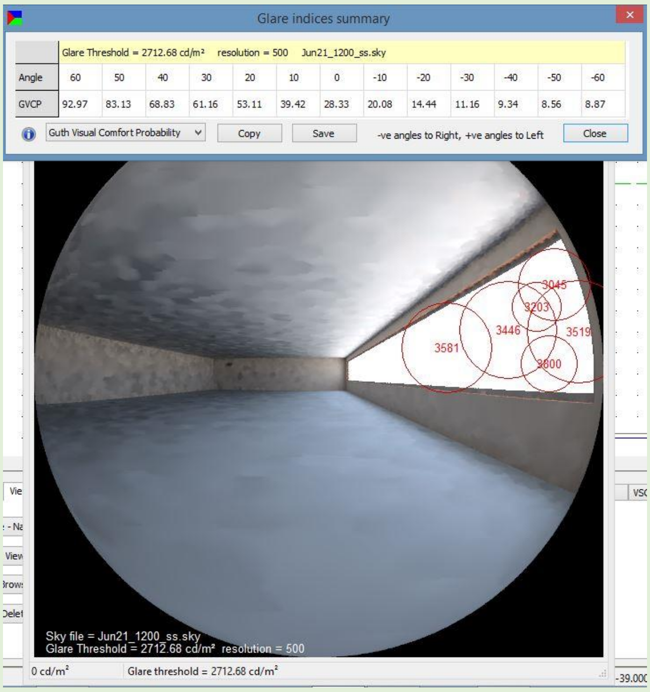
CGI



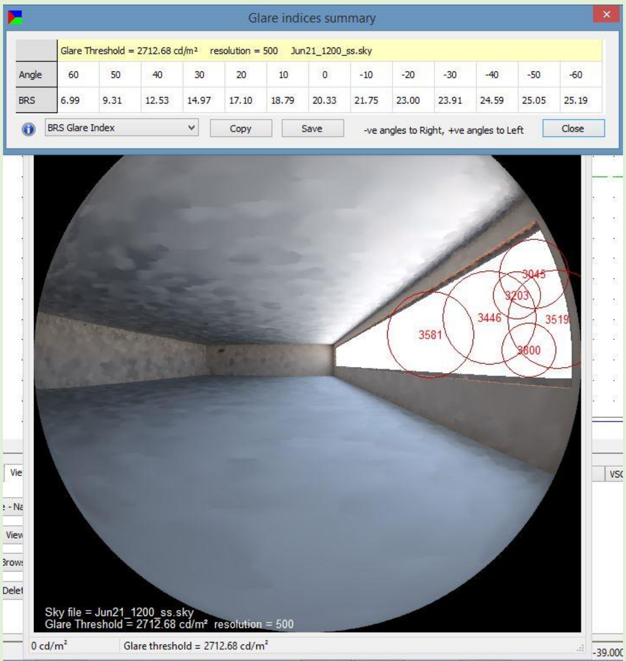
UGR



VCP


Glare indices summary
Glare Threshold = 2712.68 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 92.97 83.13 68.83 61.16 53.11 39.42 28.33 20.08 14.44 11.16 9.34 8.56 8.87
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3045
3203
3446
3519
3581
3800
Sky file = Jun21_1200_ss.sky
Glare Threshold = 2712.68 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2712.68 cd/m²

BRS


Glare indices summary
Glare Threshold = 2712.68 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 6.99 9.31 12.53 14.97 17.10 18.79 20.33 21.75 23.00 23.91 24.59 25.05 25.19
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3045
3203
3446
3519
3581
3800
Sky file = Jun21_1200_ss.sky
Glare Threshold = 2712.68 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2712.68 cd/m²

GDGR

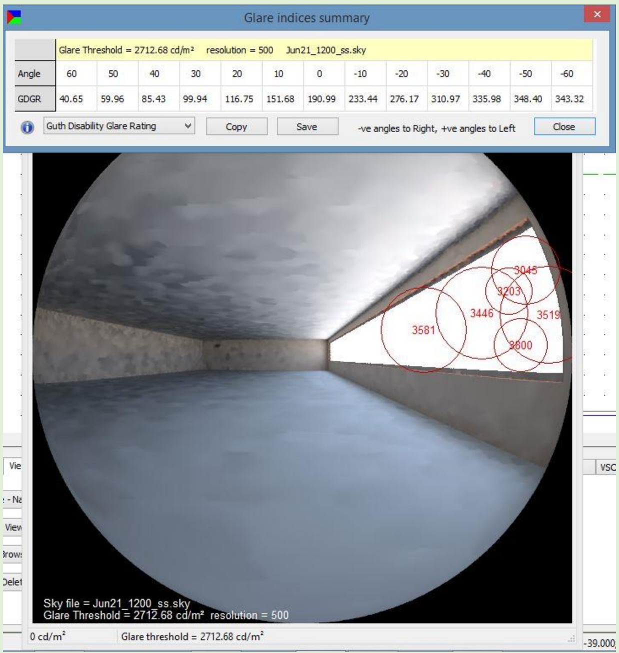
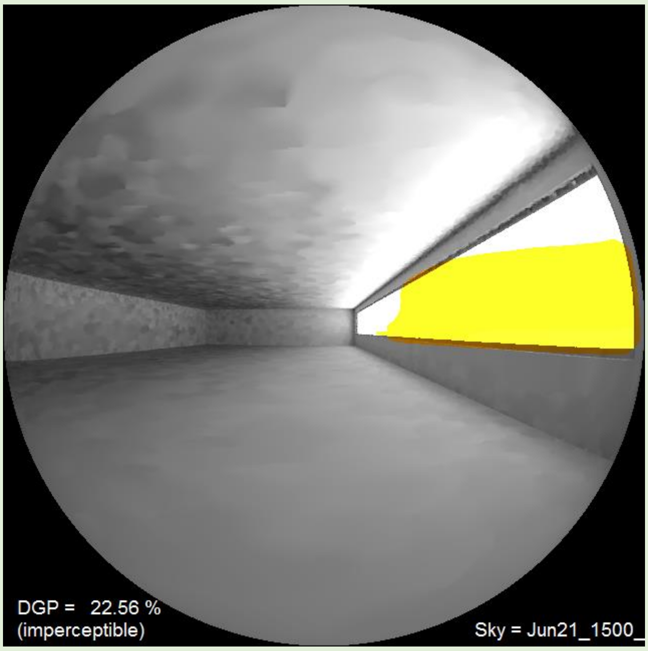
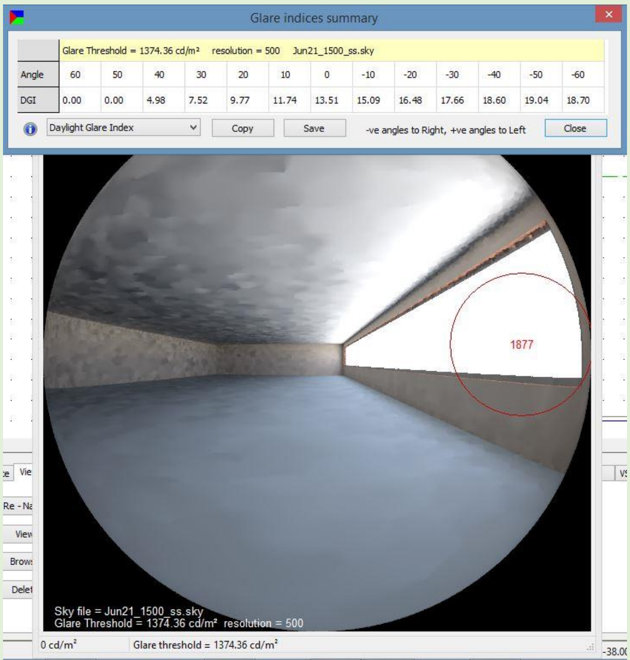
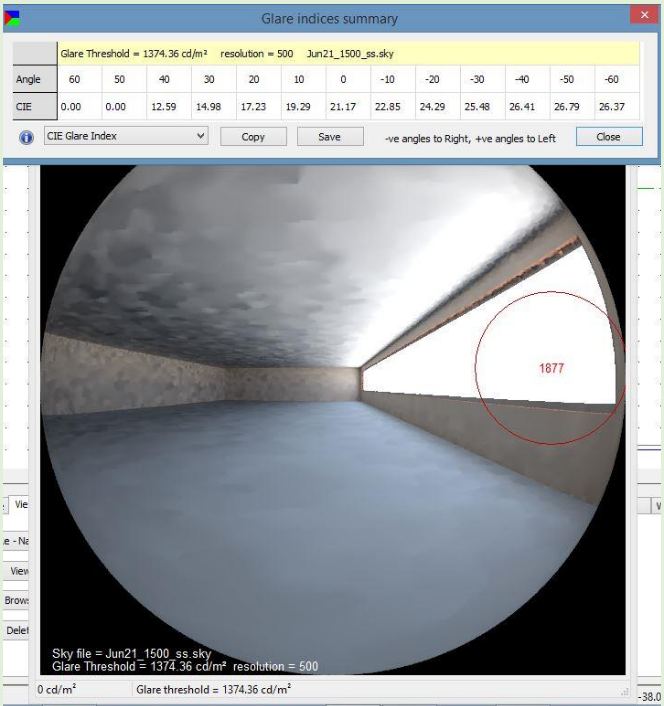
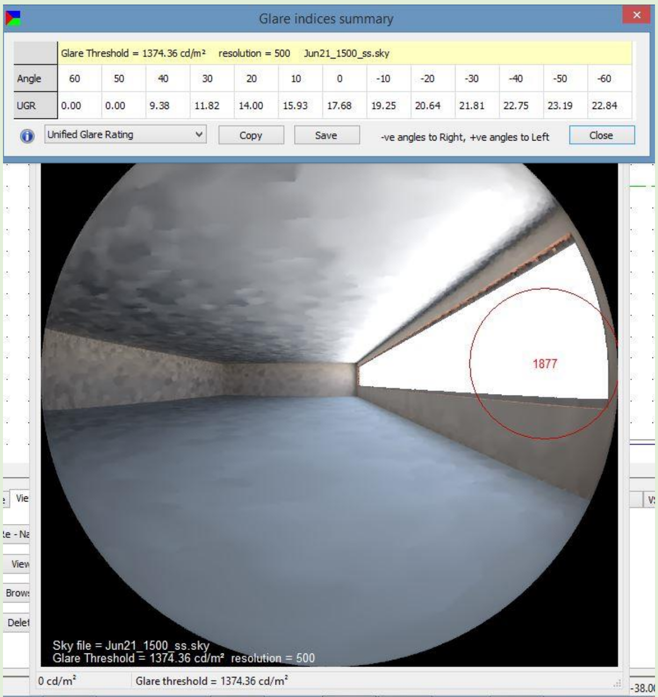
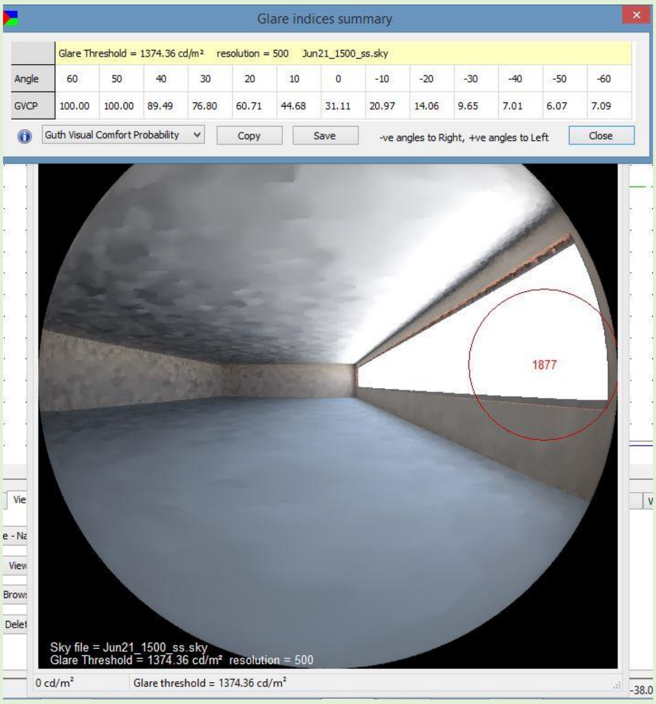
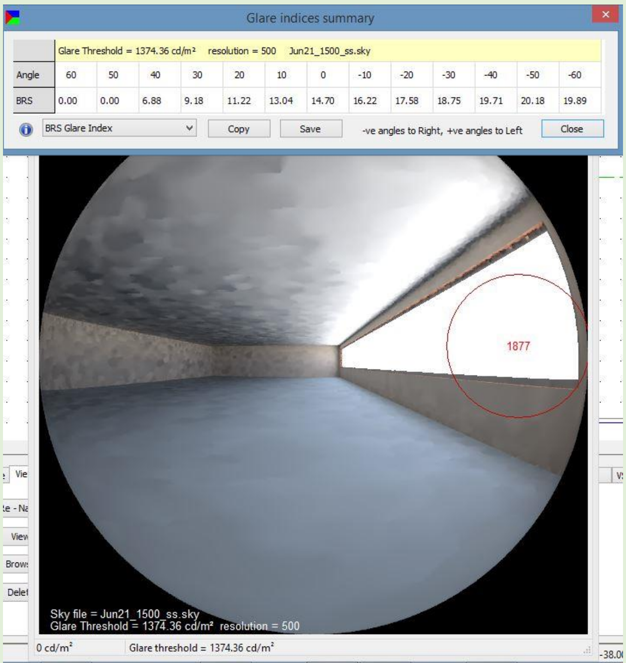

Glare indices summary
Glare Threshold = 2712.68 cd/m² resolution = 500 Jun21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 40.65 59.96 85.43 99.94 116.75 151.68 190.99 233.44 276.17 310.97 335.98 348.40 343.32
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
3045
3203
3446
3519
3581
3800
Sky file = Jun21_1200_ss.sky
Glare Threshold = 2712.68 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2712.68 cd/m²

Table 243: Daylight and Glare Analysis for Jun 21, with sunny sky, (S), (P6/3m),(T15).

Daylight and Glare Analysis for Jun 21, (sunny sky), (S), (P6/3m) (T15).	
DGP	**DGI**
	
CGI	**UGR**
	

VCP	BRS


Glare indices summary
Glare Threshold = 1374.36 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 100.00 100.00 89.49 76.80 60.71 44.68 31.11 20.97 14.06 9.65 7.01 6.07 7.09
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1877
Sky file = Jun21_1500_ss.sky
Glare Threshold = 1374.36 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1374.36 cd/m²


Glare indices summary
Glare Threshold = 1374.36 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 0.00 0.00 6.88 9.18 11.22 13.04 14.70 16.22 17.58 18.75 19.71 20.18 19.89
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1877
Sky file = Jun21_1500_ss.sky
Glare Threshold = 1374.36 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1374.36 cd/m²

GDGR

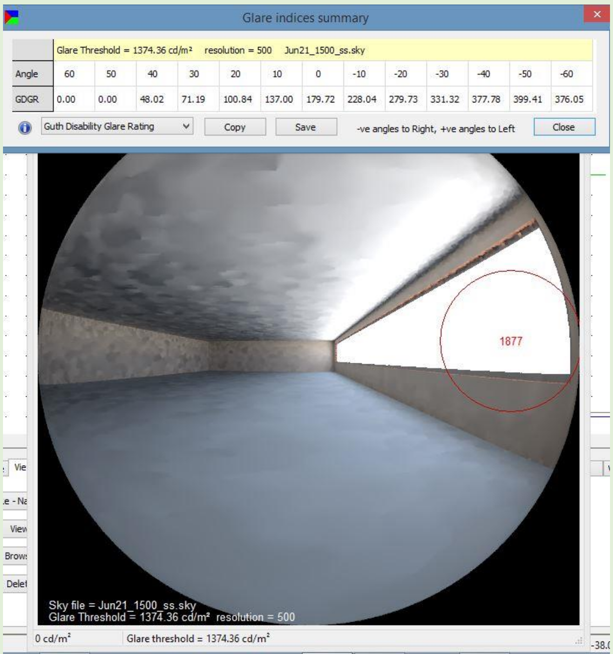
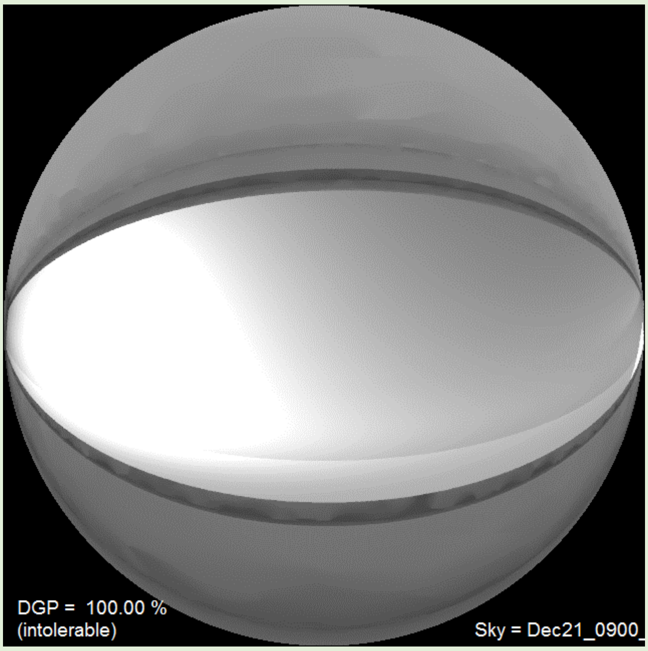

Glare indices summary
Glare Threshold = 1374.36 cd/m² resolution = 500 Jun21_1500_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 0.00 0.00 48.02 71.19 100.84 137.00 179.72 228.04 279.73 331.32 377.78 399.41 376.05
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
1877
Sky file = Jun21_1500_ss.sky
Glare Threshold = 1374.36 cd/m² resolution = 500
0 cd/m²
Glare threshold = 1374.36 cd/m²

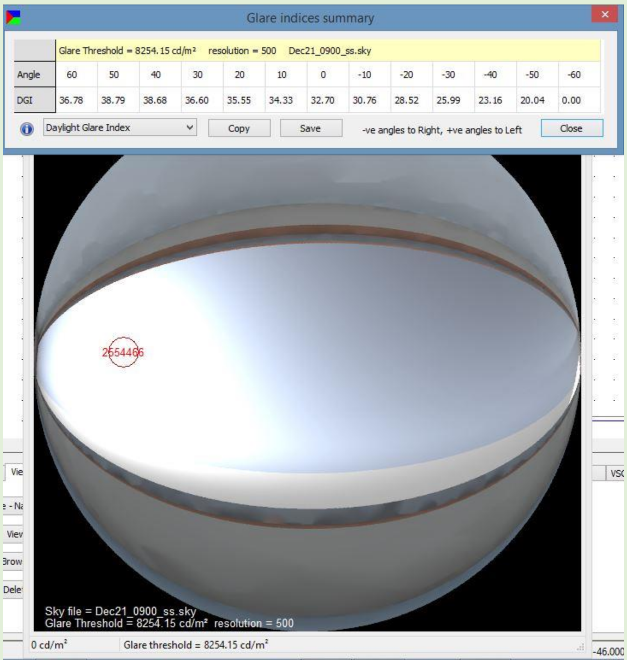
Table 244: Daylight and Glare Analysis for Dec 21, with sunny sky, (S), (P4/1.5m),(T9).

Daylight and Glare Analysis for Dec 21, (sunny sky), (S), (P4/1.5m) (T9).

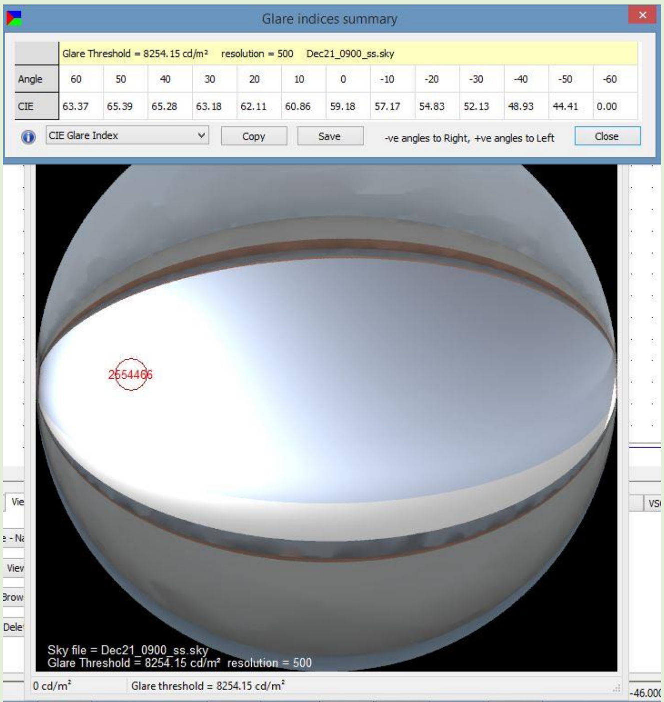
DGP



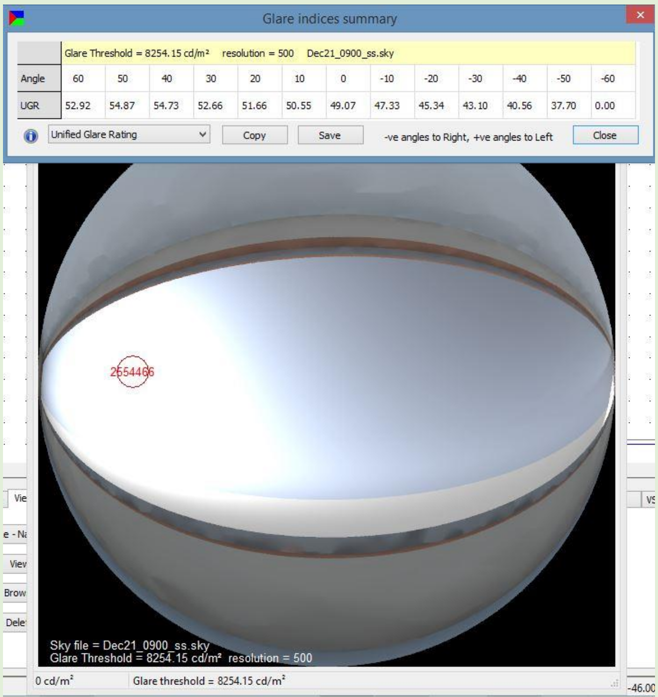
DGI



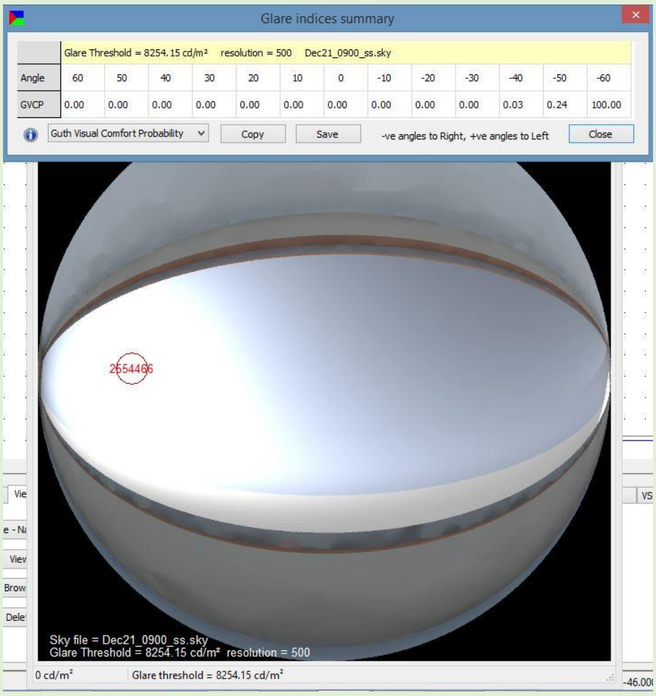
CGI



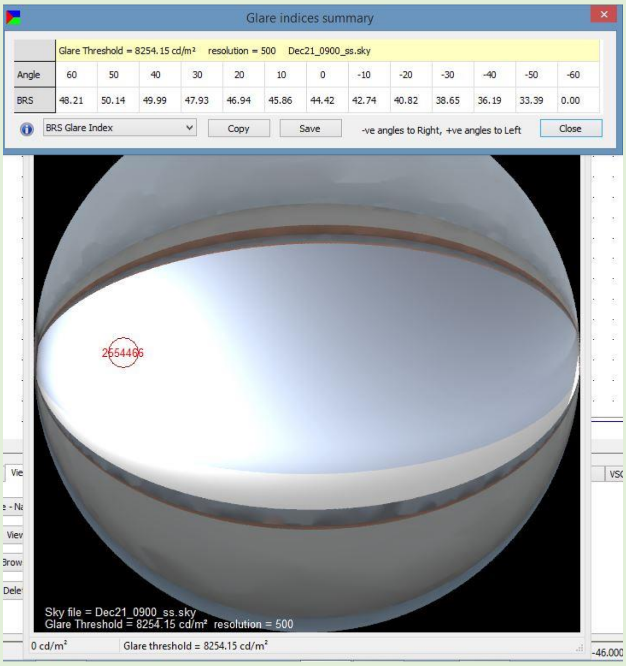
UGR



VCP


Glare indices summary
Glare Threshold = 8254.15 cd/m² resolution = 500 Dec21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.03 0.24 100.00
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2554466
Sky file = Dec21_0900_ss.sky
Glare Threshold = 8254.15 cd/m² resolution = 500
0 cd/m²
Glare threshold = 8254.15 cd/m²

BRS


Glare indices summary
Glare Threshold = 8254.15 cd/m² resolution = 500 Dec21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 48.21 50.14 49.99 47.93 46.94 45.86 44.42 42.74 40.82 38.65 36.19 33.39 0.00
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2554466
Sky file = Dec21_0900_ss.sky
Glare Threshold = 8254.15 cd/m² resolution = 500
0 cd/m²
Glare threshold = 8254.15 cd/m²

GDGR

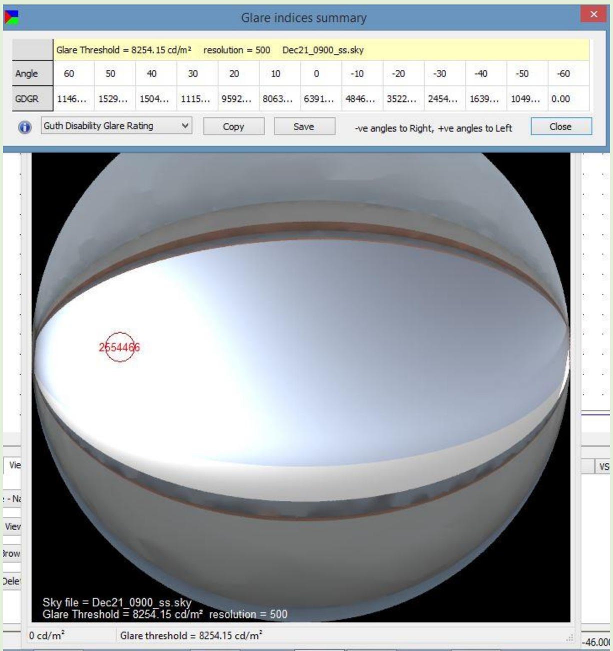
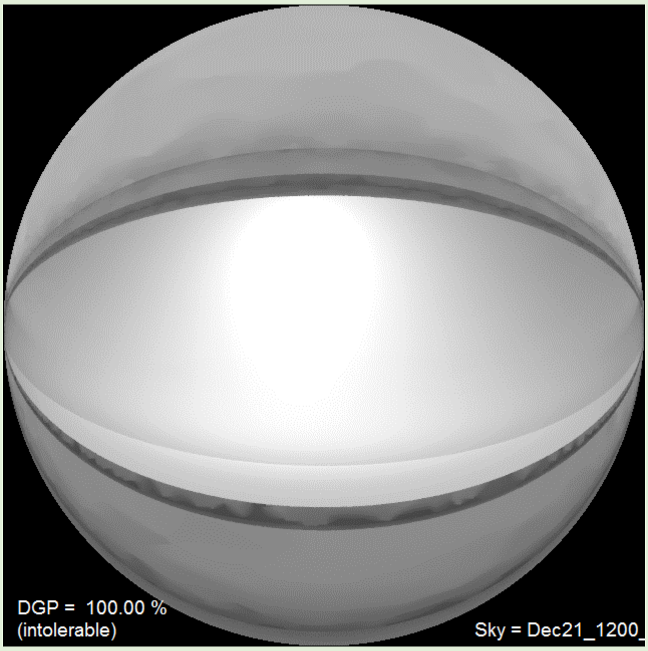

Glare indices summary
Glare Threshold = 8254.15 cd/m² resolution = 500 Dec21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 1146... 1529... 1504... 1115... 9592... 8063... 6391... 4846... 3522... 2454... 1639... 1049... 0.00
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
2554466
Sky file = Dec21_0900_ss.sky
Glare Threshold = 8254.15 cd/m² resolution = 500
0 cd/m²
Glare threshold = 8254.15 cd/m²

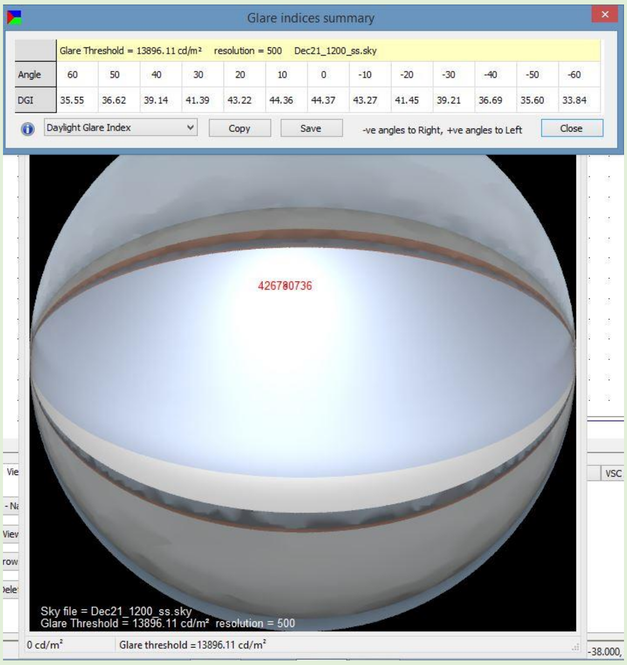
Table 245: Daylight and Glare Analysis for Dec 21, with sunny sky, (S), (P4/1.5m),(T12).

Daylight and Glare Analysis for Dec 21, (sunny sky), (S), (P4/1.5m) (T12).

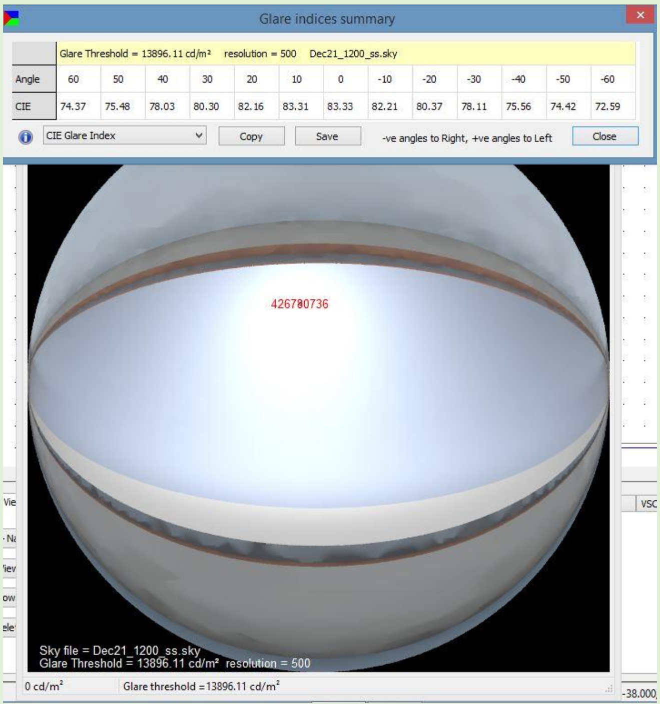
DGP



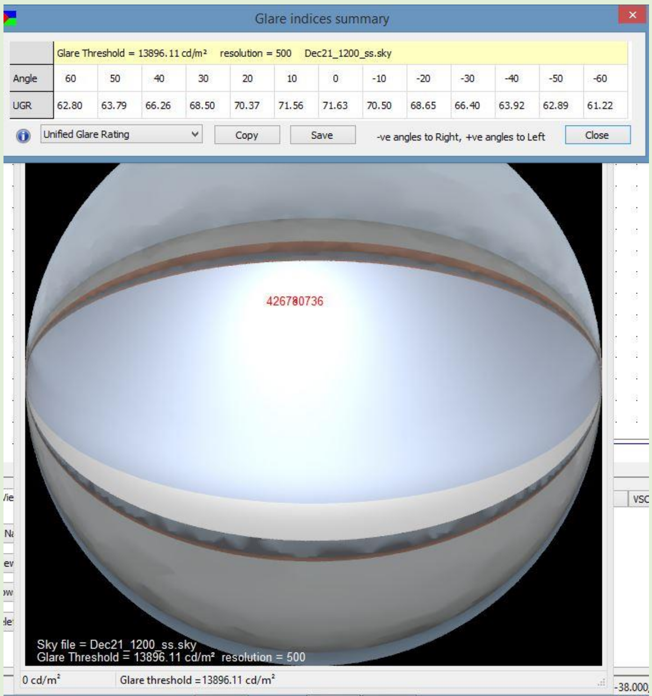
DGI

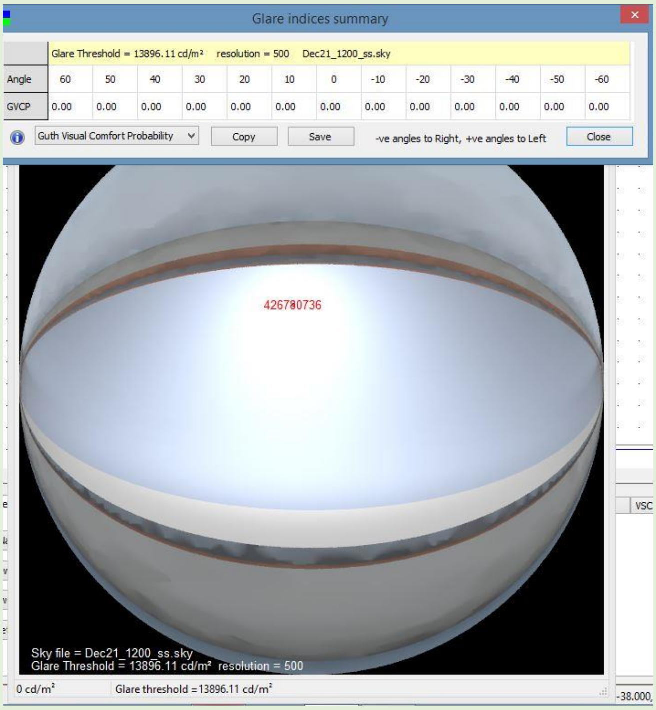
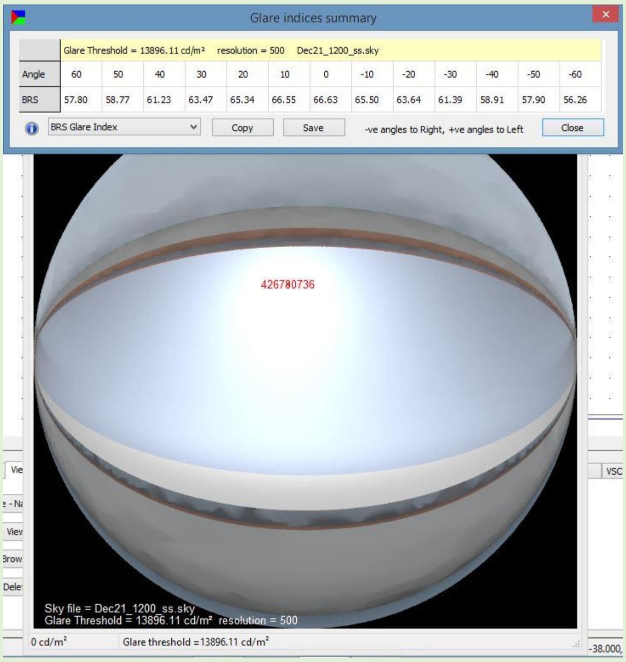


CGI



UGR

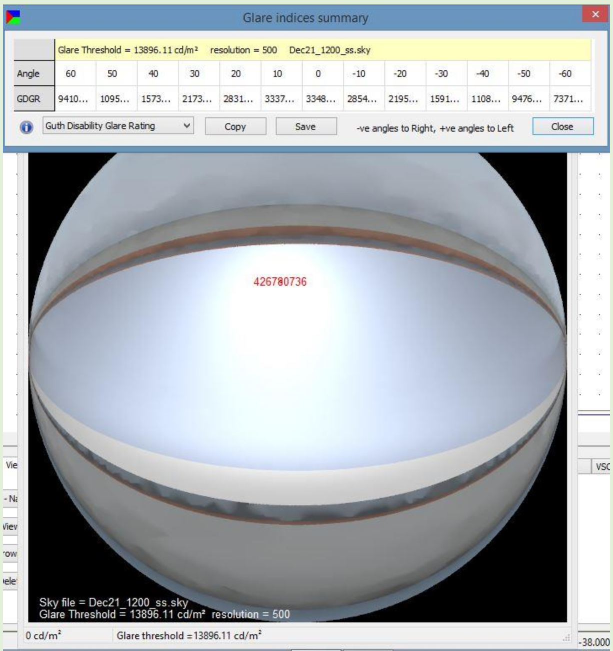


VCP	BRS
	

Glare indices summary
Glare Threshold = 13896.11 cd/m² resolution = 500 Dec21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
426780736
Sky file = Dec21_1200_ss.sky
Glare Threshold = 13896.11 cd/m² resolution = 500
0 cd/m²
Glare threshold = 13896.11 cd/m²

Glare indices summary
Glare Threshold = 13896.11 cd/m² resolution = 500 Dec21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 57.80 58.77 61.23 63.47 65.34 66.55 66.63 65.50 63.64 61.39 58.91 57.90 56.26
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
426780736
Sky file = Dec21_1200_ss.sky
Glare Threshold = 13896.11 cd/m² resolution = 500
0 cd/m²
Glare threshold = 13896.11 cd/m²

GDGR

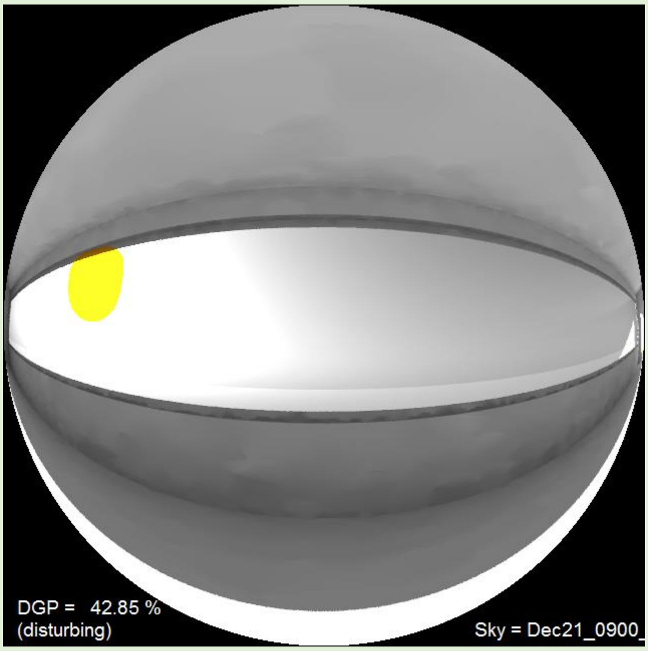


Glare indices summary
Glare Threshold = 13896.11 cd/m² resolution = 500 Dec21_1200_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 9410... 1095... 1573... 2173... 2831... 3337... 3348... 2854... 2195... 1591... 1108... 9476... 7371...
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
426780736
Sky file = Dec21_1200_ss.sky
Glare Threshold = 13896.11 cd/m² resolution = 500
0 cd/m²
Glare threshold = 13896.11 cd/m²

Table 246: Daylight and Glare Analysis for Dec 21, with sunny sky, (S), (P4/3m),(T9).

Daylight and Glare Analysis for Dec 21, (sunny sky), (S), (P4/3m) (T9).

DGP



VCP

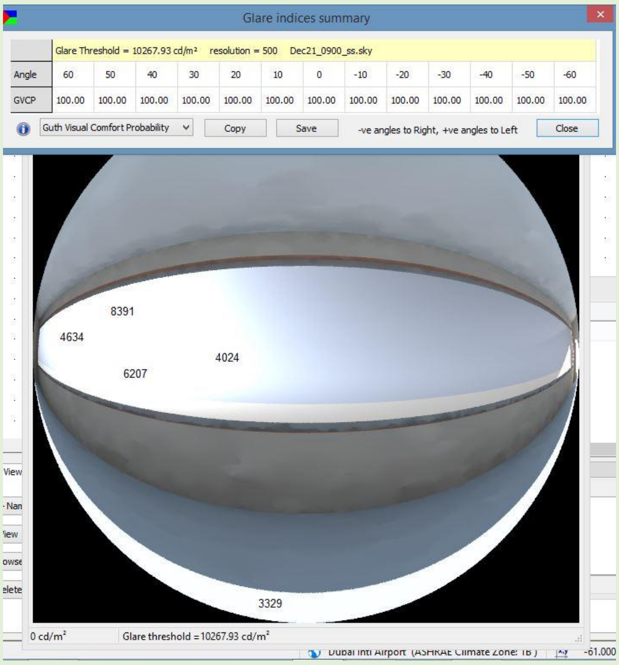
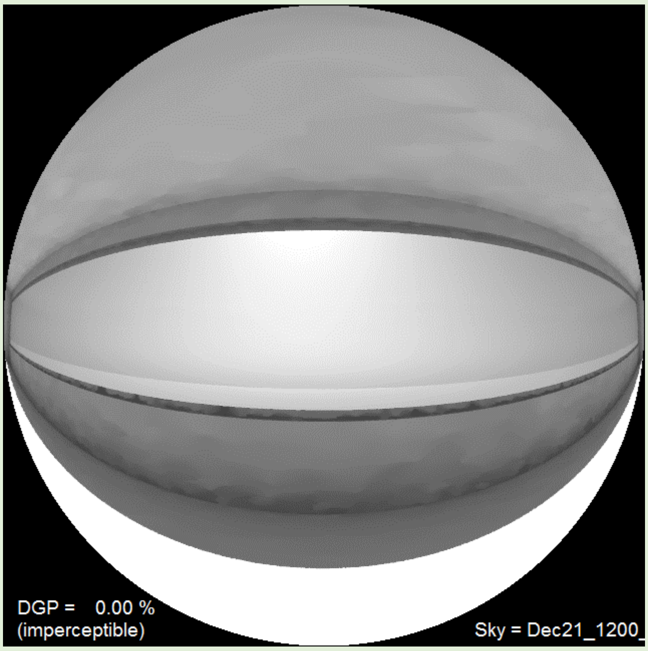


Table 247: Daylight and Glare Analysis for Dec 21, with sunny sky, (S), (P4/3m),(T12).

Daylight and Glare Analysis for Dec 21, (sunny sky), (S), (P4/3m) (T12).

DGP



VCP

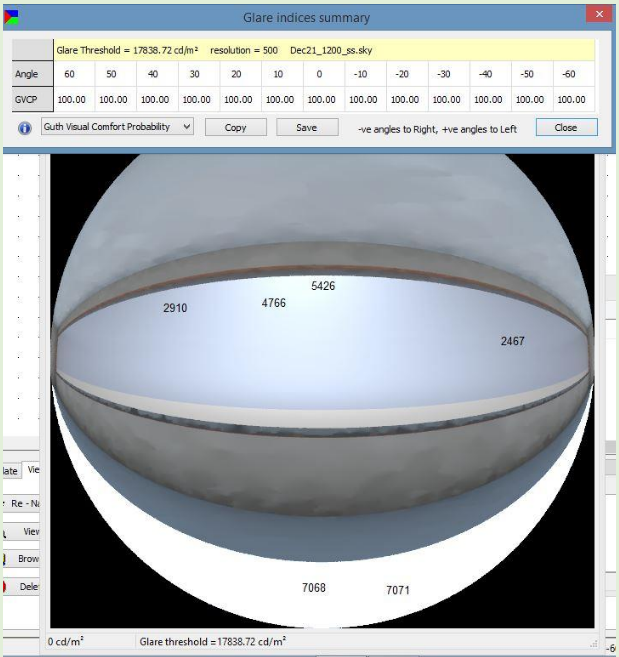
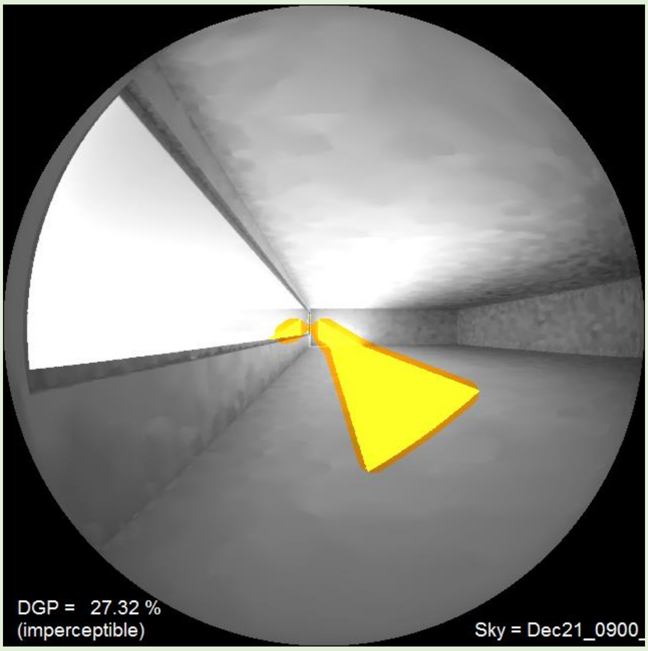


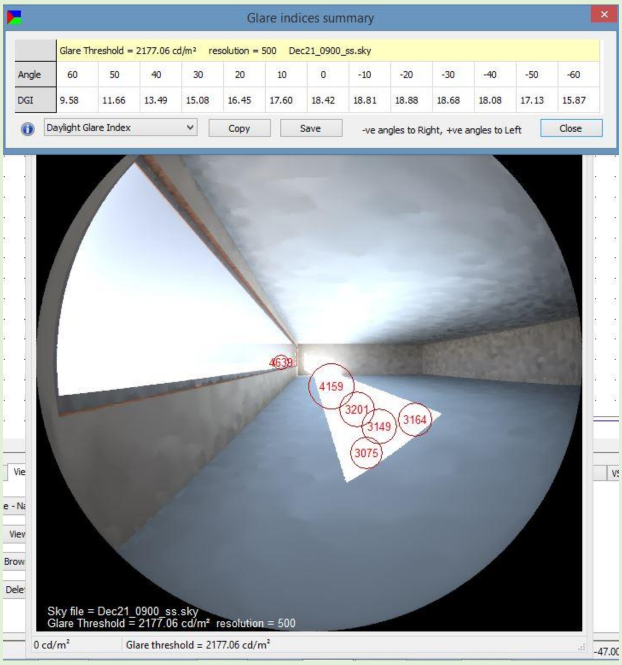
Table 248: Daylight and Glare Analysis for Dec 21, with sunny sky, (S), (P5/1.5m),(T9).

Daylight and Glare Analysis for Dec 21, (sunny sky), (S), (P5/1.5m) (T9).

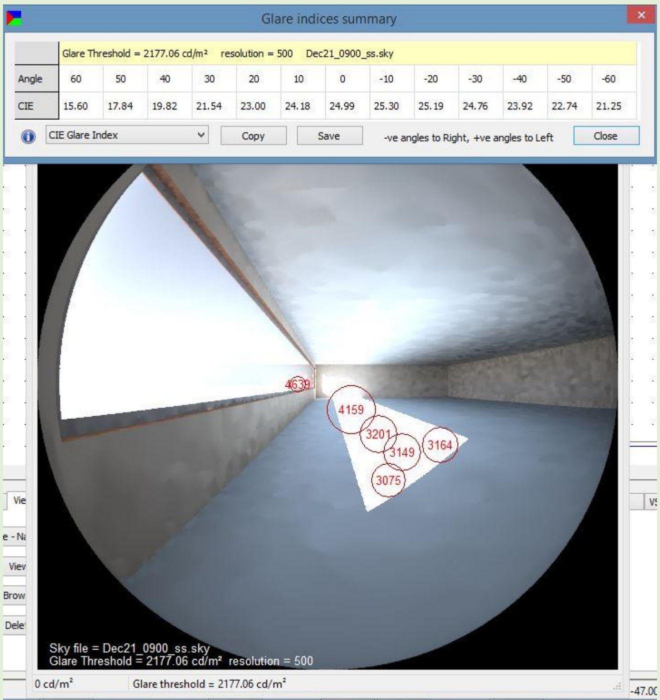
DGP



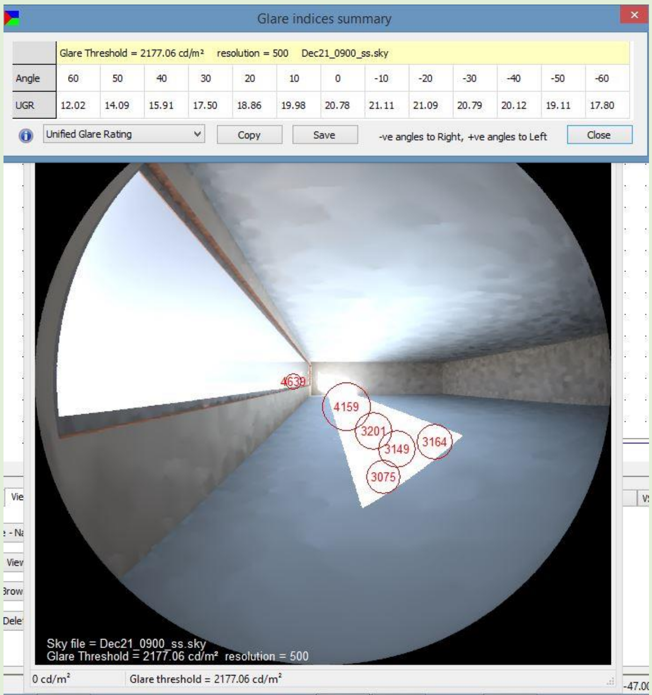
DGI



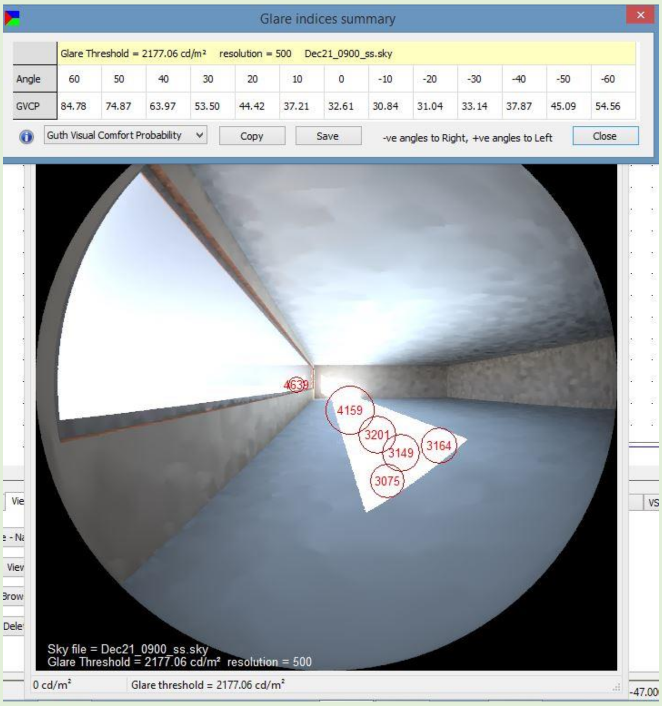
CGI



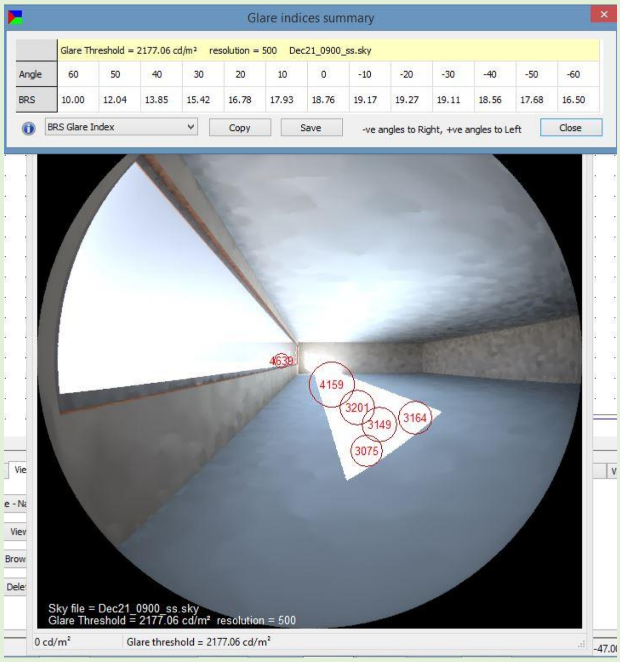
UGR



VCP


Glare indices summary
Glare Threshold = 2177.06 cd/m² resolution = 500 Dec21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 84.78 74.87 63.97 53.50 44.42 37.21 32.61 30.84 31.04 33.14 37.87 45.09 54.56
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
4639
4159
3201
3149
3164
3075
Sky file = Dec21_0900_ss.sky
Glare Threshold = 2177.06 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2177.06 cd/m²
-47.00

BRS


Glare indices summary
Glare Threshold = 2177.06 cd/m² resolution = 500 Dec21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 10.00 12.04 13.85 15.42 16.78 17.93 18.76 19.17 19.27 19.11 18.56 17.68 16.50
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
4639
4159
3201
3149
3164
3075
Sky file = Dec21_0900_ss.sky
Glare Threshold = 2177.06 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2177.06 cd/m²

GDGR

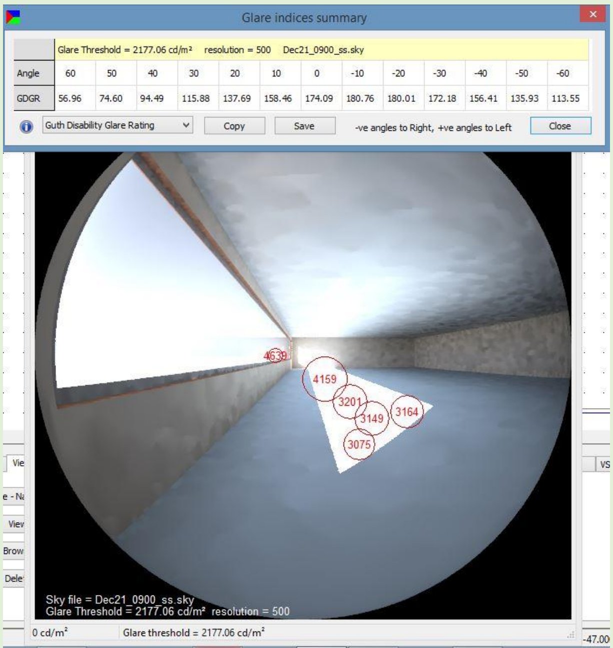

Glare indices summary
Glare Threshold = 2177.06 cd/m² resolution = 500 Dec21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 56.96 74.60 94.49 115.88 137.69 158.46 174.09 180.76 180.01 172.18 156.41 135.93 113.55
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
4639
4159
3201
3149
3164
3075
Sky file = Dec21_0900_ss.sky
Glare Threshold = 2177.06 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2177.06 cd/m²
-47.00

Table 249: Daylight and Glare Analysis for Dec 21, with sunny sky, (S), (P5/1.5m),(T12).

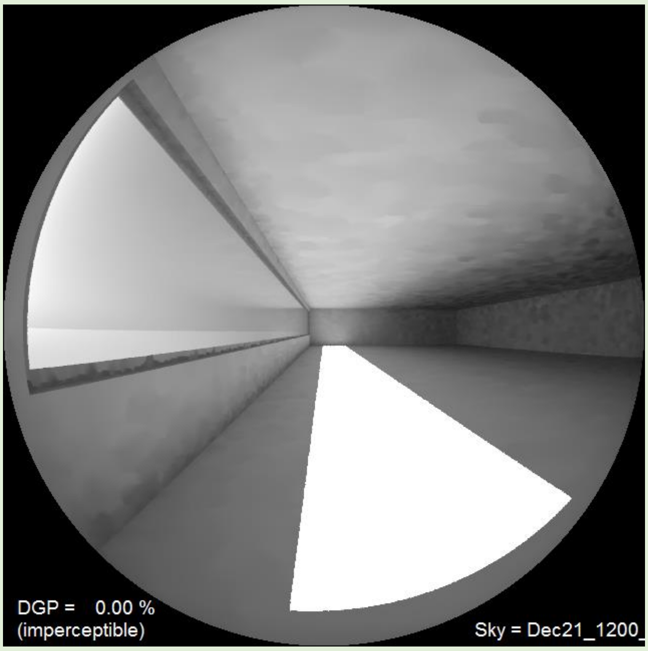
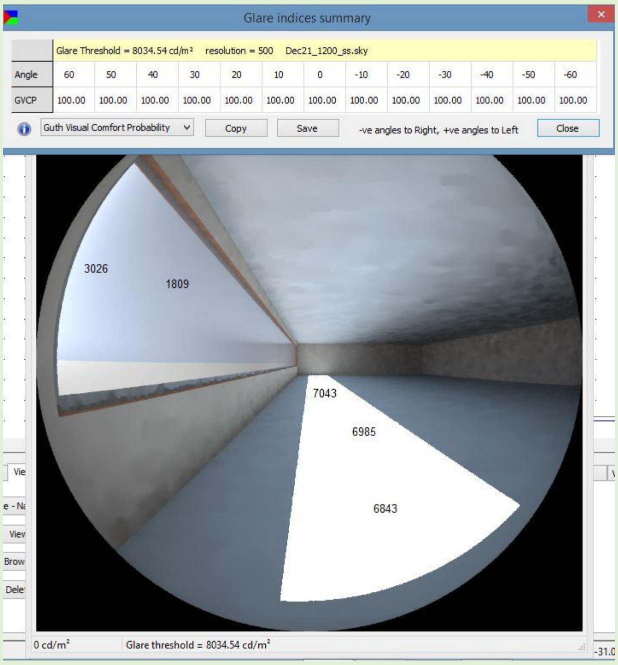
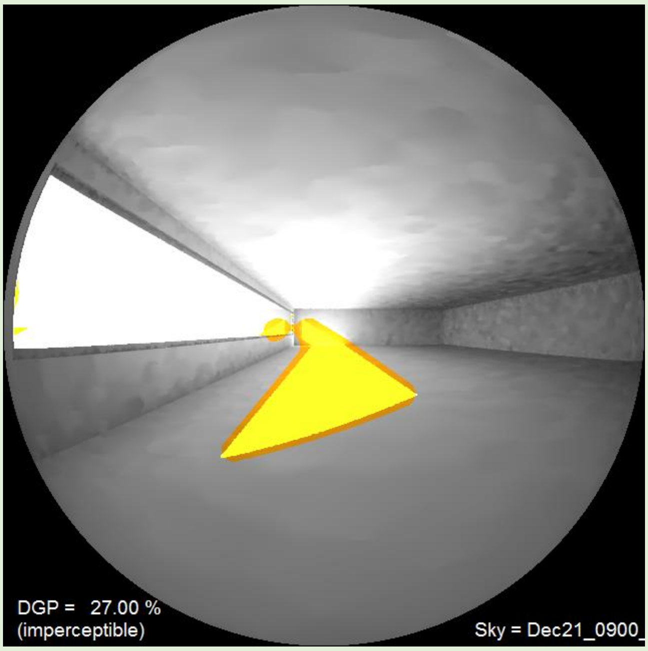
<table>
<tr><th colspan="2">Daylight and Glare Analysis for Dec 21, (sunny sky), (S), (P5/1.5m) (T12).</th></tr>
<tr><th>DGP</th><th>VCP</th></tr>
<tr><td>
</td><td>
</td></tr>
</table>

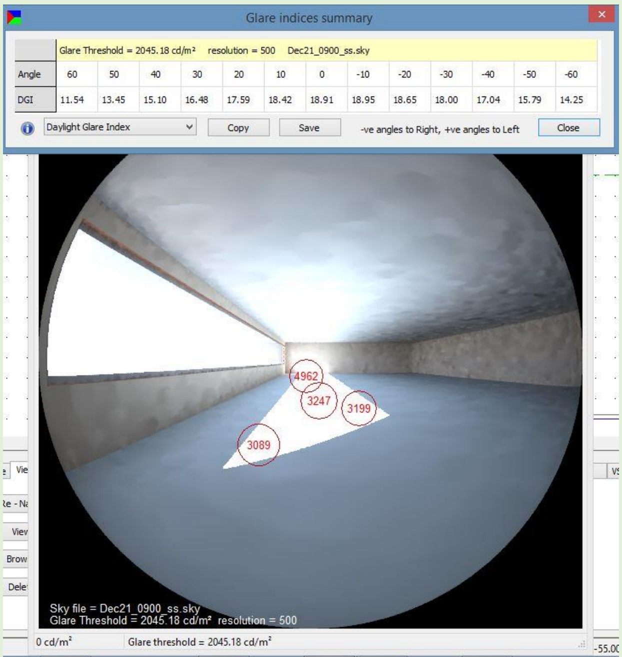
Table 250: Daylight and Glare Analysis for Dec 21, with sunny sky, (S), (P5/3m),(T9).

Daylight and Glare Analysis for Dec 21, (sunny sky), (S), (P5/3m) (T9).

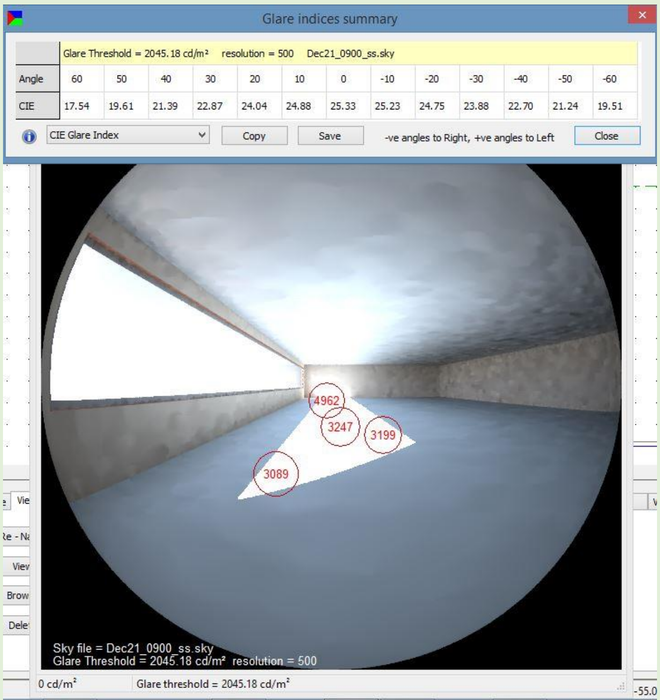
DGP



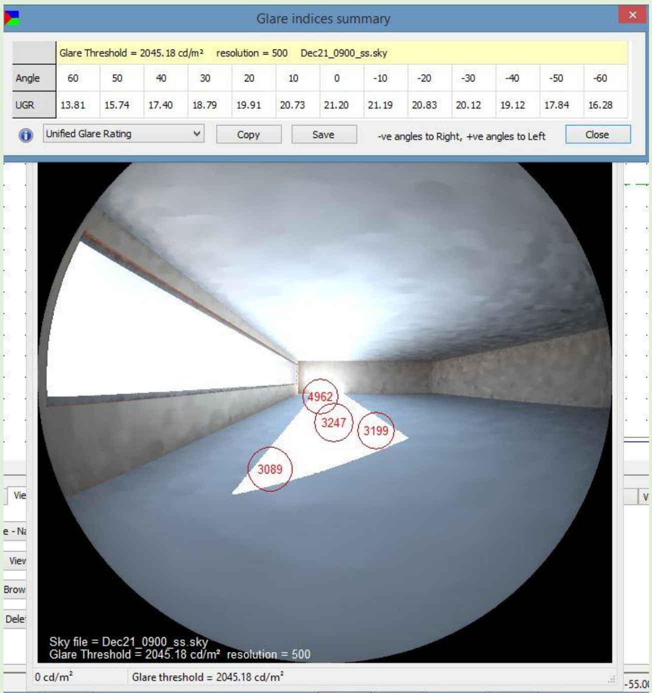
DGI

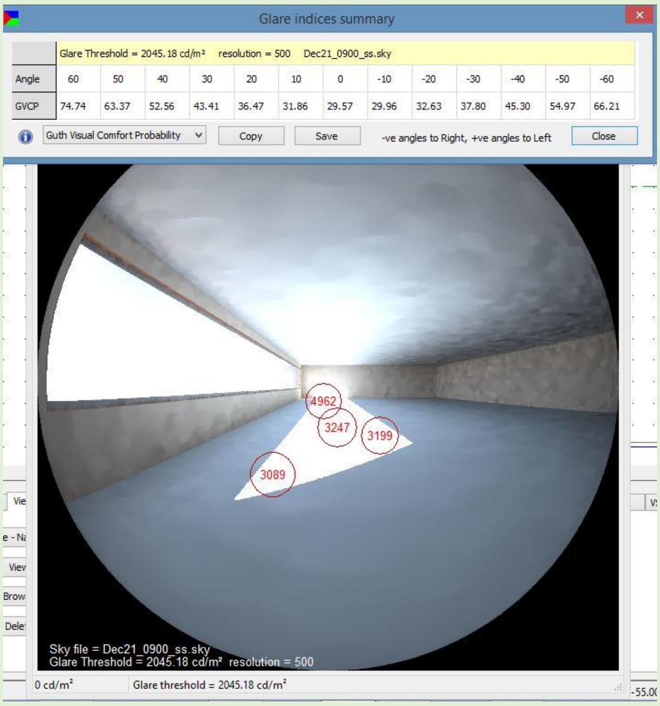
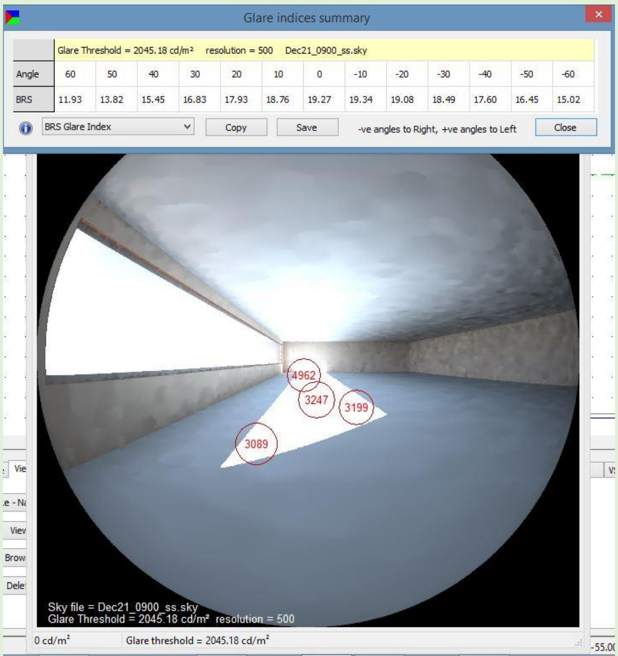


CGI



UGR

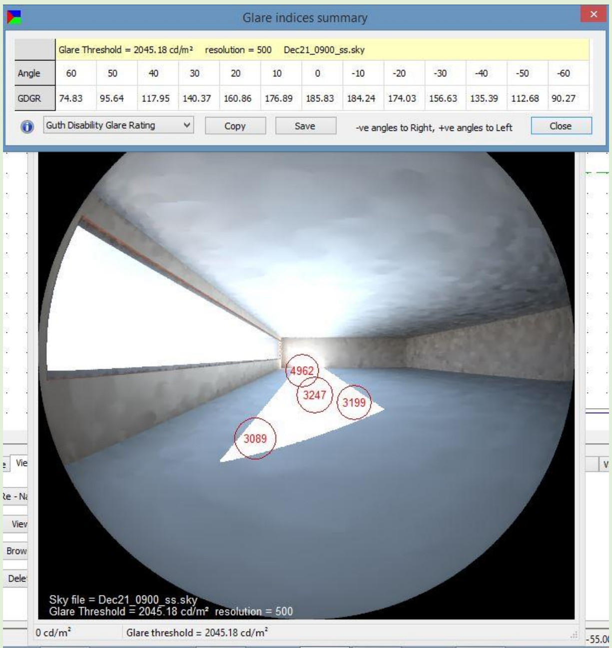


VCP	BRS
	

Glare indices summary
Glare Threshold = 2045.18 cd/m² resolution = 500 Dec21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 74.74 63.37 52.56 43.41 36.47 31.86 29.57 29.96 32.63 37.80 45.30 54.97 66.21
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
4962
3247
3199
3089
Sky file = Dec21_0900_ss.sky
Glare Threshold = 2045.18 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2045.18 cd/m²

Glare indices summary
Glare Threshold = 2045.18 cd/m² resolution = 500 Dec21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 11.93 13.82 15.45 16.83 17.93 18.76 19.27 19.34 19.08 18.49 17.60 16.45 15.02
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
4962
3247
3199
3089
Sky file = Dec21_0900_ss.sky
Glare Threshold = 2045.18 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2045.18 cd/m²

GDGR



Glare indices summary
Glare Threshold = 2045.18 cd/m² resolution = 500 Dec21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 74.83 95.64 117.95 140.37 160.86 176.89 185.83 184.24 174.03 156.63 135.39 112.68 90.27
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
4962
3247
3199
3089
Sky file = Dec21_0900_ss.sky
Glare Threshold = 2045.18 cd/m² resolution = 500
0 cd/m²
Glare threshold = 2045.18 cd/m²

Table 251: Daylight and Glare Analysis for Dec 21, with sunny sky, (S), (P5/3m),(T12).

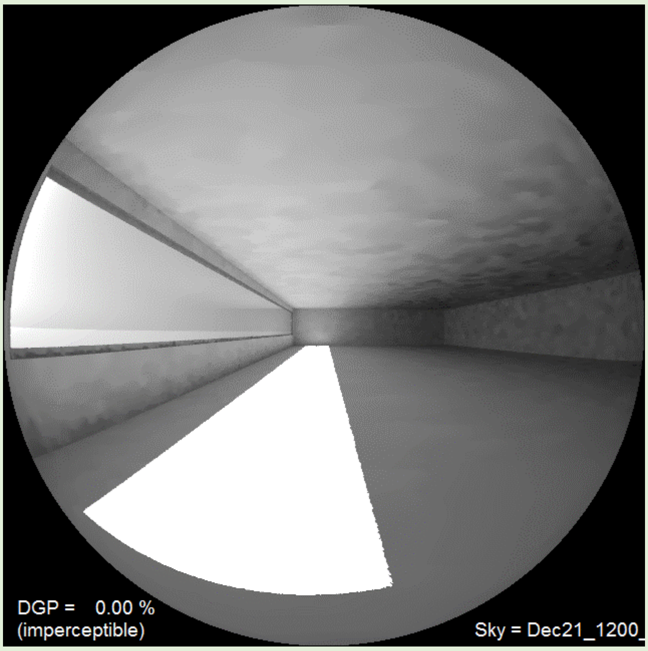
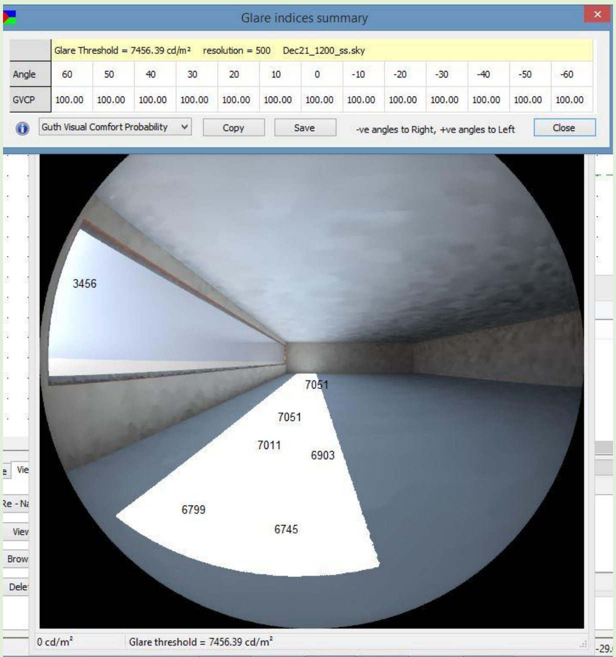
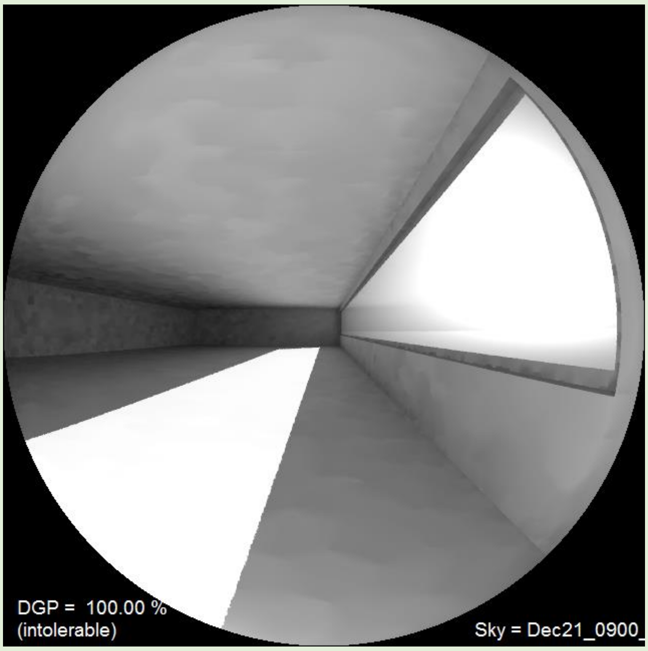
Daylight and Glare Analysis for Dec 21, (sunny sky), (S), (P5/3m) (T12).	
DGP	**VCP**
	

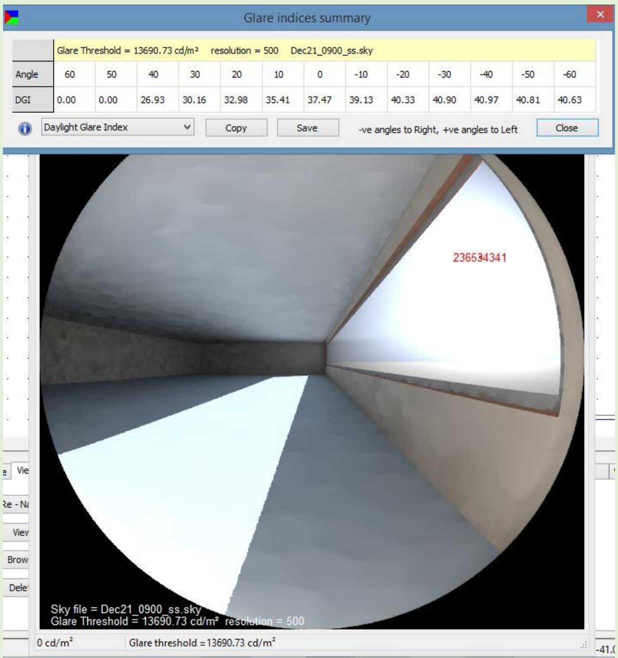
Table 252: Daylight and Glare Analysis for Dec 21, with sunny sky, (S), (P6/1.5m),(T9).

Daylight and Glare Analysis for Dec 21, (sunny sky), (S), (P6/1.5m) (T9).

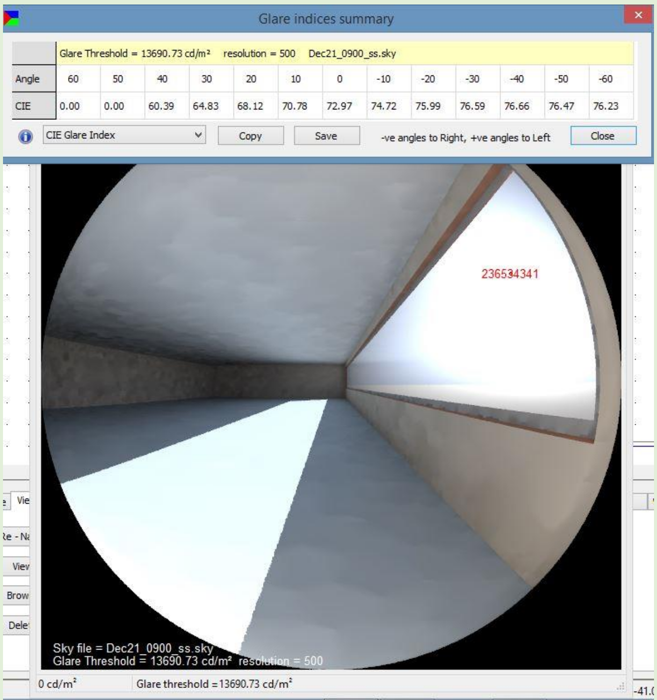
DGP



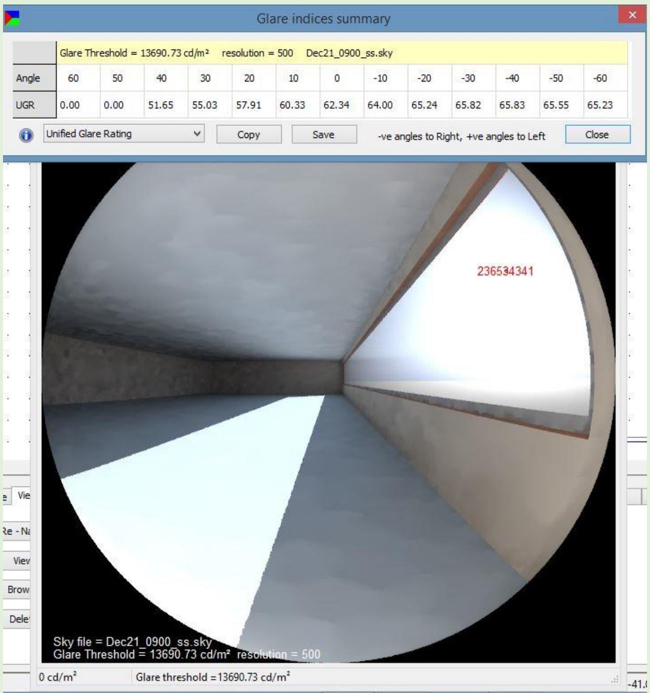
DGI

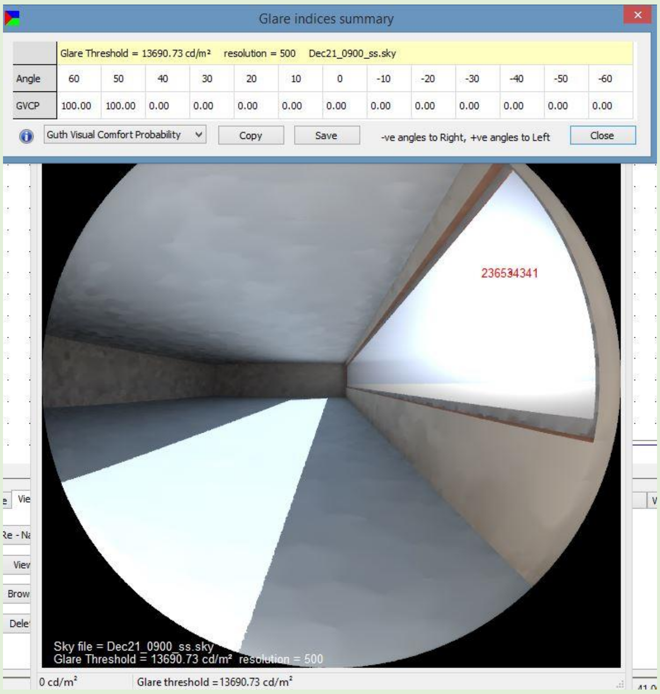
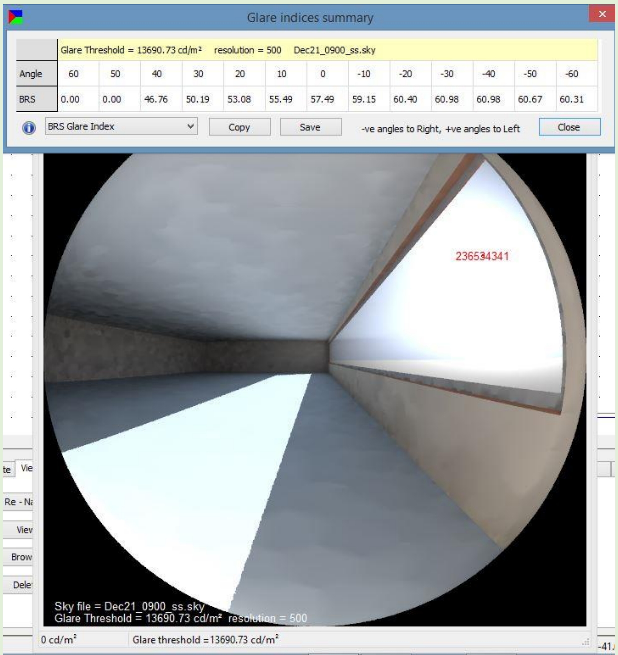


CGI



UGR

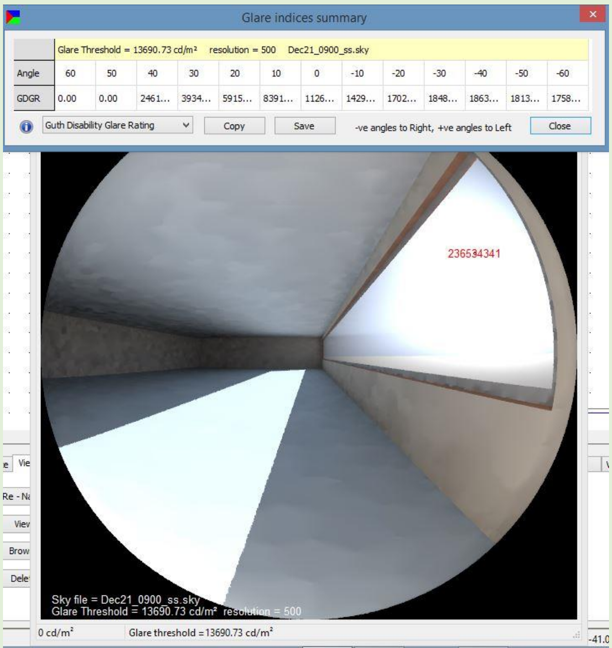


VCP	BRS
	

Glare indices summary
Glare Threshold = 13690.73 cd/m² resolution = 500 Dec21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 100.00 100.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
236534341
Sky file = Dec21_0900_ss.sky
Glare Threshold = 13690.73 cd/m² resolution = 500
0 cd/m²
Glare threshold = 13690.73 cd/m²

Glare indices summary
Glare Threshold = 13690.73 cd/m² resolution = 500 Dec21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 0.00 0.00 46.76 50.19 53.08 55.49 57.49 59.15 60.40 60.98 60.98 60.67 60.31
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
236534341
Sky file = Dec21_0900_ss.sky
Glare Threshold = 13690.73 cd/m² resolution = 500
0 cd/m²
Glare threshold = 13690.73 cd/m²

GDGR



Glare indices summary
Glare Threshold = 13690.73 cd/m² resolution = 500 Dec21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 0.00 0.00 2461… 3934… 5915… 8391… 1126… 1429… 1702… 1848… 1863… 1813… 1758…
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
236534341
Sky file = Dec21_0900_ss.sky
Glare Threshold = 13690.73 cd/m² resolution = 500
0 cd/m²
Glare threshold = 13690.73 cd/m²

Table 253: Daylight and Glare Analysis for Dec 21, with sunny sky, (S), (P6/1.5m),(T12).

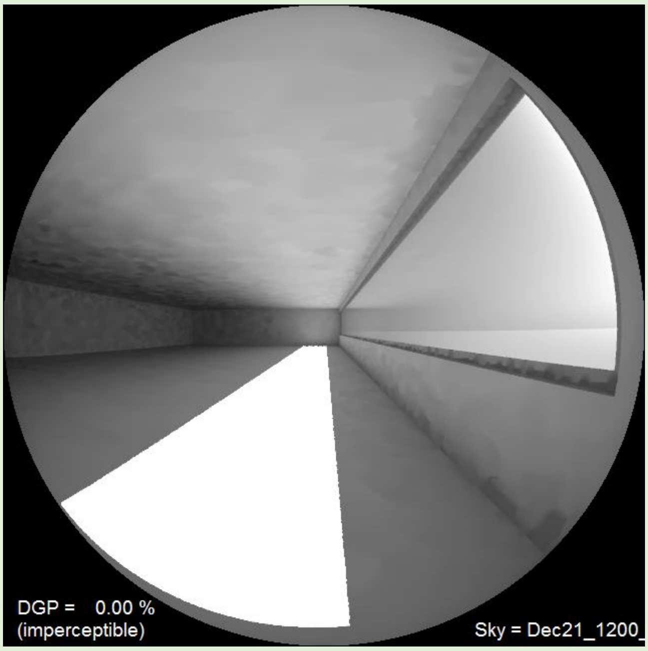
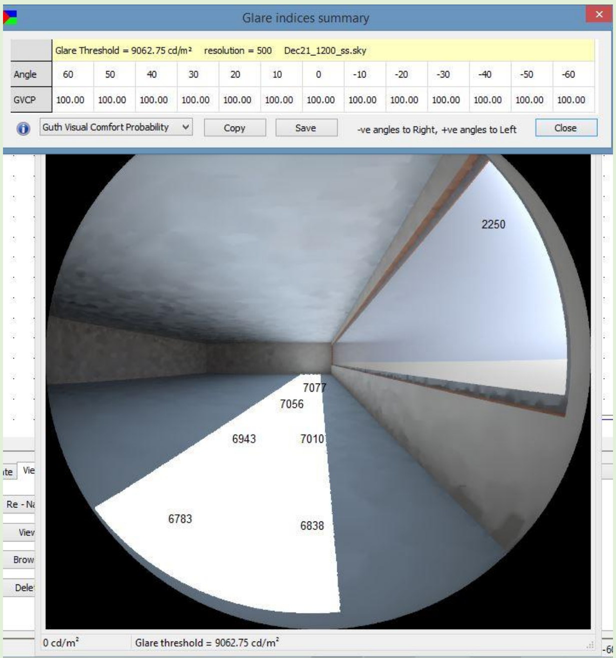
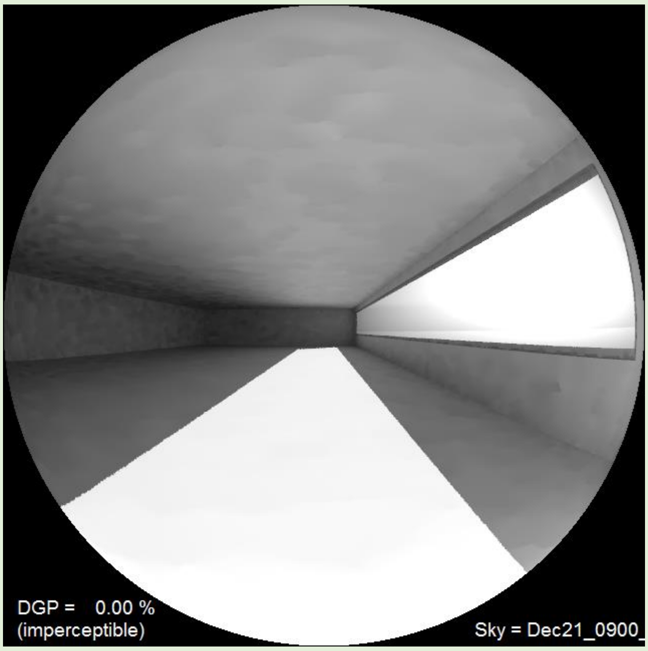
<table>
<tr><th colspan="2">Daylight and Glare Analysis for Dec 21, (sunny sky), (S), (P6/1.5m) (T12).</th></tr>
<tr><th>DGP</th><th>VCP</th></tr>
<tr><td>
</td><td>
</td></tr>
</table>

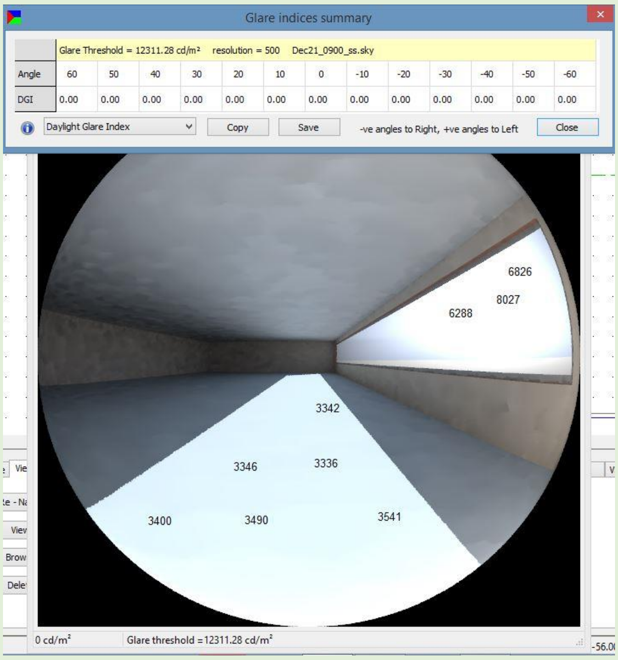
Table 254: Daylight and Glare Analysis for Dec 21, with sunny sky, (S), (P6/3m),(T9).

Daylight and Glare Analysis for Dec 21, (sunny sky), (S), (P6/3m) (T9).

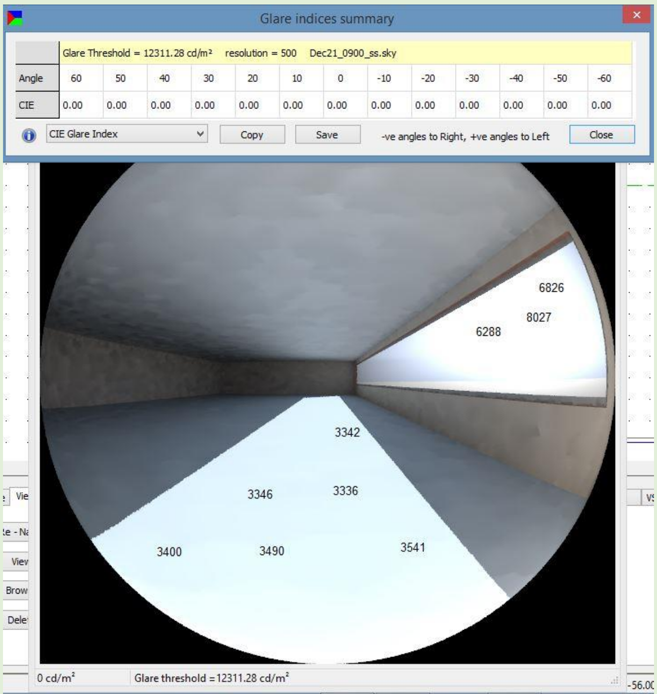
DGP



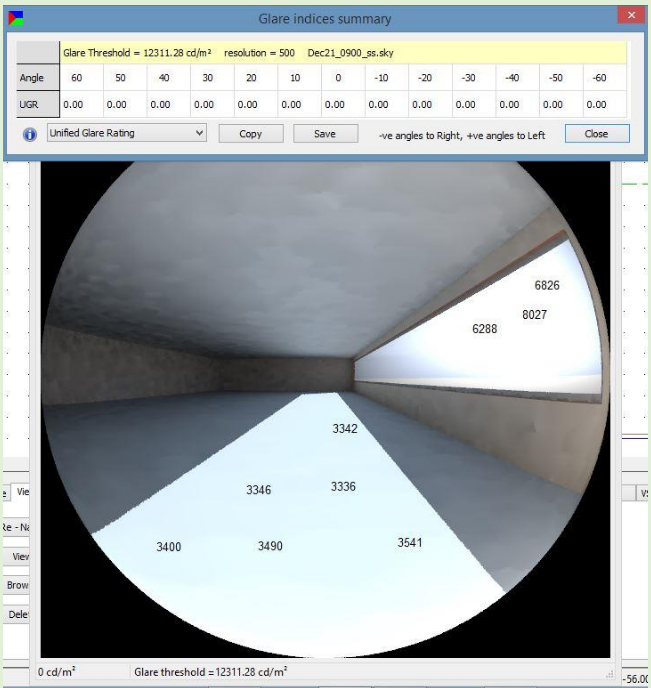
DGI



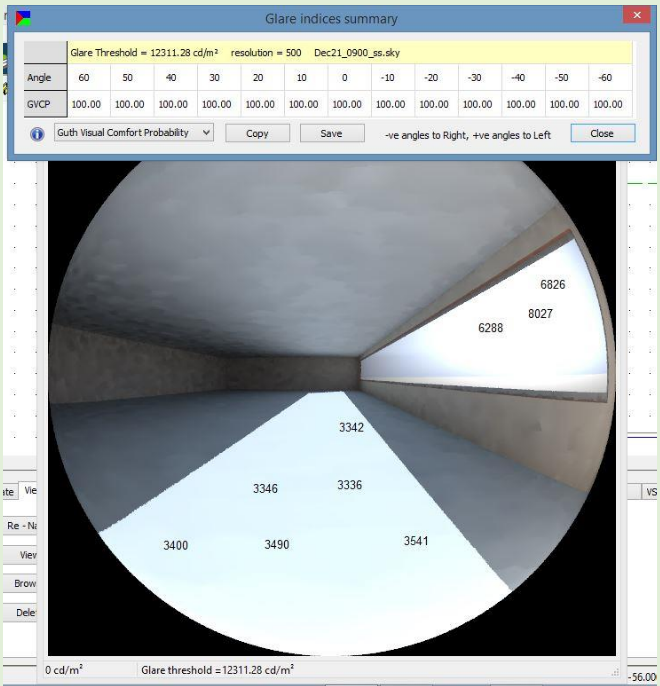
CGI



UGR

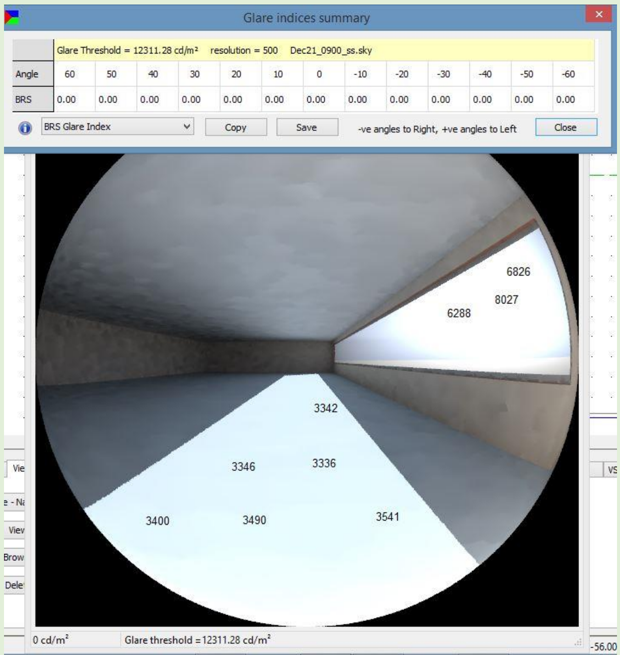


VCP



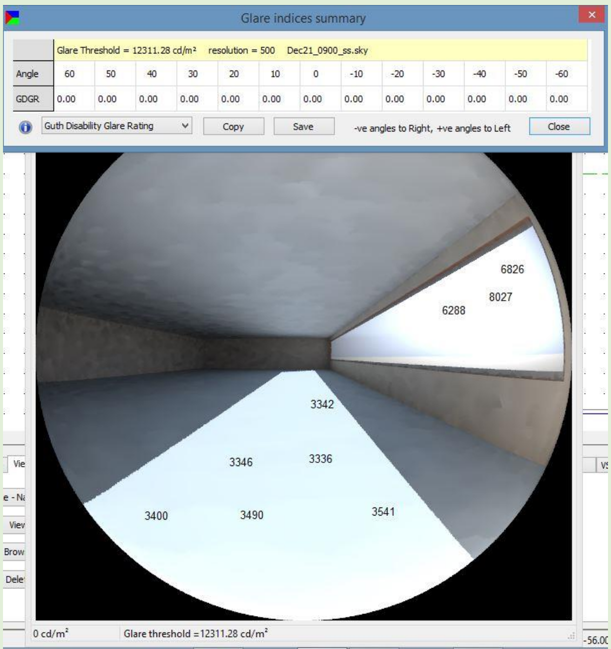
Glare indices summary
Glare Threshold = 12311.28 cd/m² resolution = 500 Dec21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GVCP 100.00 100.00 100.00 100.00 100.00 100.00 100.00 100.00 100.00 100.00 100.00 100.00 100.00
Guth Visual Comfort Probability
Copy
Save
-ve angles to Right, +ve angles to Left
Close
6826
8027
6288
3342
3346
3336
3400
3490
3541
0 cd/m²
Glare threshold = 12311.28 cd/m²
-56.00

BRS



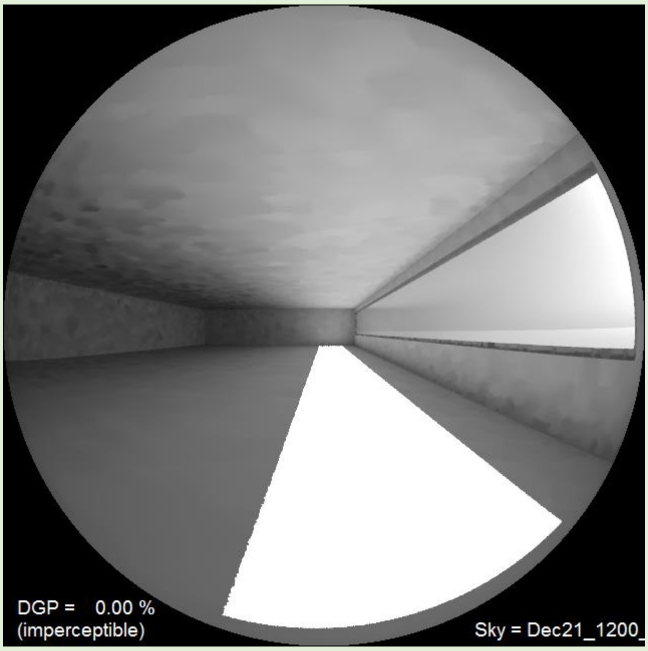
Glare indices summary
Glare Threshold = 12311.28 cd/m² resolution = 500 Dec21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
BRS 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
BRS Glare Index
Copy
Save
-ve angles to Right, +ve angles to Left
Close
6826
8027
6288
3342
3346
3336
3400
3490
3541
0 cd/m²
Glare threshold = 12311.28 cd/m²
-56.00

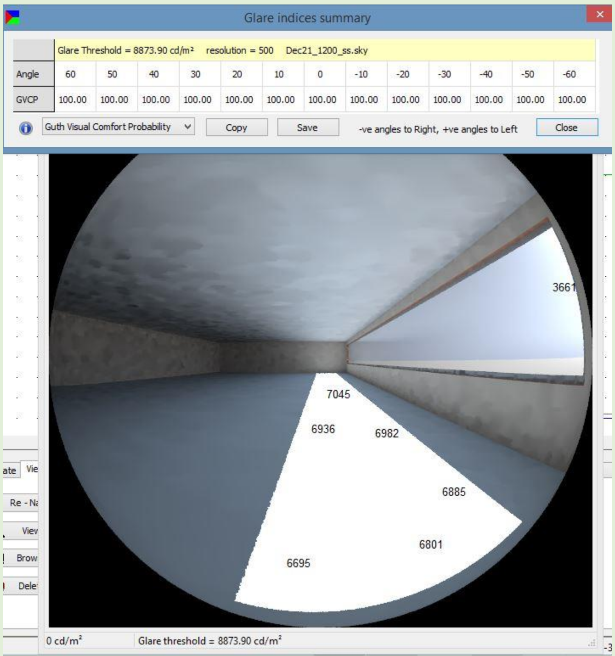
GDGR



Glare indices summary
Glare Threshold = 12311.28 cd/m² resolution = 500 Dec21_0900_ss.sky
Angle 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60
GDGR 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
Guth Disability Glare Rating
Copy
Save
-ve angles to Right, +ve angles to Left
Close
6826
8027
6288
3342
3346
3336
3400
3490
3541
0 cd/m²
Glare threshold = 12311.28 cd/m²

Table 255: Daylight and Glare Analysis for Dec 21, with sunny sky, (S), (P6/3m),(T12).

<table>
<tr><th colspan="2">Daylight and Glare Analysis for Dec 21, (sunny sky), (S), (P6/3m) (T12).</th></tr>
<tr><th>DGP</th><th>VCP</th></tr>
<tr><td>


</td><td>


</td></tr>
</table>